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THE LIVER IN ITS RELATION TO OPERATIONS ON THE BILIARY TRACT AND THE STOMACH

By George W. Crile, M.D.

Cleveland, Ohio

THAT the liver is a vital organ is proved by the fact that after excision of the liver animals undergo a progressive loss of energy—indicated by a progressive loss of muscular power and fall of body temperature—until death, which usually occurs within twenty-four hours.

Every impairment of the function of the liver, therefore, may not only seriously handicap the patient but may prove a serious menace to life itself. We propose in this paper to point out the possibility that the pathologic states requiring operation on the stomach or biliary passages; or the effect of the operation and the anesthetic; or the combination of these factors may so impair the liver function as to jeopardize or even kill the patient.

Every surgeon probably has performed apparently successful operations on the stomach and the biliary passages of patients weakened by disease, by obstruction, or by starvation. At the close of the operation the prognosis may seem promising but the following postoperative picture soon begins to develop: the patient becomes increasingly apathetic; his energy is slowly depleted; though tired and weak, he cannot sleep; his tongue becomes increasingly dry; the pulse gradually rises and its volume steadily decreases; bile is suppressed; nourishment is refused; the patient's demeanor is cheerless and despondent. The patient seems to be steadily sinking in the quicksand of some fundamental failure of normal metabolism. No means suffice to change the course of

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events. The patient either gradually recovers or else he gradually becomes first delirious, and then unconscious until death.

This is the familiar picture after operations on patients starved because of pyloric obstruction, or because of protracted vomiting from any cause; or after operations on patients exhausted by chronic empyema of the gall-bladder or by long continued infections from common duct stones. The temperature and pulse of these starved patients may be normal. If the prognosis be based on pulse and temperature alone, therefore, the greatest errors may be made.

I did not realize the full significance of the fundamental metabolic conditions in these cases before I made use of the transfusion of blood in the case of a patient in an advanced stage of starvation resulting from pyloric obstruction. Blood transfusion carried this patient through the operation with an efficient circulation—with pink lips even—which was maintained after the operation also. But the early promise of success disappeared as the metabolic destruction caused the picture to change. In spite of the good circulation the patient declined through increasing apathy and progressive somnolence to unconsciousness and death. I have seen this metabolic quicksand inaugurate the same fatal sequence after long delayed operations upon emaciated, starved, common-duct cases, especially when the duct was packed with stones; and after the most careful explorations in advanced cases of cancer of the stomach. Happily the fatal sequel is rare, but many patients having wider margins of safety sail perilously near the rocks.

It seemed to me of vital importance to find the explanation of these phenomena; and to discover by what means the slender margin of safety in these cases may be preserved or perchance widened. The key to both problems was furnished by certain experiments in progress in my laboratory which were being carried on to discover what tissues and organs of the body were concerned in the transformation of the energy acquired from the environment into energy available for the needs of the body. In these experiments histologic examinations were made of every organ and tissue in animals which had been subjected to prolonged insomnia; to infection; to fear; to physical injury under anesthesia. In every case histologic changes were noted in three organs only, the brain, the suprarenals, and the liver. In each of these organs the cells became vacuolated and shrunken, the nuclei became misshapen and some nuclei disappeared. In proportion to the intensity of the stimulus and the length of time the stimulus was applied the number of altered cells and the degree of disintegration increased. In the case of the liver, after prolonged stimulation, the cells stained poorly, the cytoplasm was vacuolated, the nuclei were crenated, and the cell membranes were irregular, the most marked changes occurring in the cells nearest the periphery of the lobules.

That the histologic changes in the liver are not due to metabolism or to toxic products but that they are "work" changes incident to the conversion of latent into kinetic energy and that the brain, the suprarenals, and the liver are interdependent is proved by the facts, (1) that the average duration of life after excision of the liver is about the same as after adrenalectomy—approximately eighteen hours; and (2) that the amount of glycogen in the liver was diminished in those experiments in which there was evidence of brain-suprarenal activity.

From these premises we must consider that the brain, the suprarenals, and the liver are mutally dependent upon each other in the conversion of latent into kinetic energy.

Prominent among the products of this transformation of latent into kinetic energy are acids. We may say that every motion, every emotion, every injury, every physical exertion, every degree of fever, every reaction to infection or to auto-intoxication, every respiratory movement, every heart beat, produces an acid. Under normal conditions these acids are neutralized into harmless compounds which are eliminated by the kidney, so that under normal conditions the body tissues and fluids are for the most part slightly alkaline. If every activity of the body produces acidity in a greater or less degree, it is vitally necessary for the body to maintain a large margin of safety against acidosis by the presence of alkaline salts and bases, which are derived from food. Experiments have shown that for the maintenance of its normal state of slight alkalinity, the body is dependent primarily upon the liver and secondarily upon the suprarenals. When the liver is excised the blood soon loses its slight alkalinity and in a few hours becomes acid. When the suprarenals are excised the alkalinity of the blood is maintained for a longer period—perhaps twice as long—but it then becomes acid, and in each case the acidity of the blood is the close precursor of death. The excision of no other organ in the body produces this tendency to immediate acidosis.

We cannot dwell here upon other experimental observations which show the relative activities of the liver and the suprarenals in this neutralizing process nor the additional evidence that the liver and the adrenals are directly controlled by the brain, which also controls the transformation of energy, which in turn as we have already stated, always produces acidity; we will merely recapitulate by saying that the harder the body is driven by any stimulus, the more rapidly will latent energy be transformed into kinetic energy. The more rapid the transformation of energy,—the greater the production of acid. The greater the production of acid, the greater also the strain upon the power of neutralization possessed by the liver and the suprarenals, and the greater the drain upon the body's store of alkalies and bases. When the liver and the suprarenals are overtaxed and the alkalies and bases are exhausted, the state of acidosis is reached.

Still another fact established by laboratory experimentation has an important bearing upon our problem—especially as it applies to common-duct operations. The liver performs its function in part through hormone action and in part through direct innervation. It is curious that for the performance of at least a part of its function it is necessary for the liver to have a simultaneous hormone and nerve stimulation. Now the nerve supply of the liver is derived from the sympathetic system, the nerve fibres passing along the blood vessels and the common duct. As during the processes of evolution these nerves have been thus abundantly sheltered against injury, they have not evolved physical qualities for their protection as have the peripheral nerves. In the course of common-duct operations performed by an operator who is unaware of this grave danger, the nerve supply to the liver will be more or less blocked by the trauma of the operation. If the block be light and the patient have sufficient endurance, the temporary loss of liver function will be safely bridged; on the other hand, the more severe the trauma of the nerves, the more completely will the nerves be blocked and the longer will that block last. This conclusion corresponds exactly with our clinical facts and makes it evident that surgery has been riding rough shod over an extremely vulnerable mechanism.

Another factor which has a vital bearing upon the treatment of the class of patients we are considering is *the anæsthetic*. Clinically it has long been recognized that when a patient is in a state of exhaustion resulting from infection, from injury, from shock, from starvation, from hemorrhage—from any cause whatsoever, he may never recover consciousness after the administration of a general anæsthetic. In a Hungarian reference, the title of which I do not recollect at the moment, it is shown that starved dogs inevitably die after inhalation anæsthesia. Clinicians know well how unsafe it is to give a general anæsthetic of any kind to a patient on the verge of acidosis. A patient with chronic vomiting, with or without chronic pyloric obstruction, with an acetone odour of the breath, with peculiarly pink lips and dry tongue and mouth, will in all probability never regain consciousness after being anæsthetized. The aged not infrequently die under even a short anæsthesia.

Why do not these patients recover? If the patient has the power of consciousness before the anæsthetic is administered, what happened during the anæsthesia to make it impossible for the patient to regain consciousness? We have already referred to the acid-producing power of stimuli. Shall we conclude therefore that the trauma of the operation alone may have pushed beyond the margin of safety the neutralizing powers of the body already taxed by preëxisting conditions; or is the anæsthetic itself a factor in producing the fatal result?

To answer this question Dr. Menten in my laboratory made for me observations of the H-ion concentration of the blood under various conditions—the H-ion concentration being an index of the acidity of the blood. H-ion concentration tests were made after the application of many kinds of stimuli, the results of which confirmed the postulate which we have already stated, that acidity is the result of the activation of the body by any adequate stimulus. The blood was then tested to determine the H-ion concentration in ether anæsthesia, in nitrous oxid anæsthesia and after the administration of alcohol and other stimulants and of morphin. Both ether and nitrous oxid produced a marked increase in the H-ion concentration, that is, both produced acidity in the blood. After coming out from the anæsthetic this acidity was neutralized by the animal in about thirty minutes. The lighter the anæsthesia, however, the shorter was the period before neutralization was accomplished. This result gave us our clue to the tendency to acidosis and to death under anæsthesia of weak and emaciated patients. The increased acidity produced by the anæsthesia was sufficient to overcome the already narrow margin of safety. That acid intoxication *follows* the adminstration of ether and chloroform has been noted by many observers—that acidity being evidenced by the early appearance in the urine of acetone and later diacetic acid. It has also been noted, as one writer states, that the "starvation preceding and following the operation is also a factor of considerable importance."

Our experiments have shown, however, that the increased acidity actually develops *during the anæsthesia* itself, sometimes to a fatal degree, and that a starved condition is not only of "considerable" but of *prime* importance since it means that the acid-neutralizing power of the liver has been surely impaired, possibly lost.

Two more important clues were obtained from the result of the H-ion concentration tests after the administration of morphin and of alcohol. Alcohol caused acidity, the acidity not being so marked, however, as that produced by the anæsthetics. The H-ion concentration was not altered by morphin no matter what the size of the dose. When the adminstration of morphin preceded the induction of anæsthesia then a smaller amount of the anæsthetic was required to produce complete anæsthesia, and the H-ion concentration test showed that the acidity was markedly less than in anæsthetized animals which had not received the preliminary dose. The preliminary dose of morphin not only lessened the degree of acidity produced by the anæsthetic but it in no way interfered with the return of the blood to its normal alkalinity; on the contrary—and the following observation is of great significance—if the morphin was given *after* acidity had been produced by the anæsthetic, it postponed the time of neutralization and, if given in large doses, *prevented* the animal from overcoming the acidosis. That is, it would appear that morphin controls the mechanism which governs the neutralization or alkalinization of the blood.

In these facts we may find the explanation of the outcome we have described as the occasional sequence, in handicapped patients, of operations on the gall-bladder and stomach. If under normal conditions a definite amount of energy is stored in each of these vitals organs—the brain, the suprarenals, and the liver, then any reduction of this amount by the psychic or physical environment incident to an operation diminishes by so much the safety of the operation. This is true of any operation, but in the operations which we are considering, when one of these vital organs has itself been attacked by the pathological condition for which relief is sought, the integrity of that organ is still further endangered.

In this explanation we may find the clue to the solution of our second problem—the development of measures which will protect or perchance widen the patient's margin of safety.

Every further drain upon the energy remaining in the organs of the kinetic system must be minimized or prevented if possible. In suitable cases pre-operative emotion must be minimized by pre-operative medication. Nitrous-oxide-oxygen instead of ether should be the anæsthetic, since this anæsthetic does not impair the immunity as does ether.

Nerve blocking with novocain should precede every division of nerve-bearing tissue; trauma should be minimized by employing sharp bloodless dissection and by the avoidance of pulling and tearing manipulations; postoperative pain should be minimized by quinine and urea hydrochloride injected at a distance from the line of incision but including the entire area of operation; the postoperative environment should be made cheerful and hopeful, narcotics being used when required to prevent pain and undue psychic strain.

In brief, then, the mortality and morbidity attending gastric and gall-bladder operations may be still further reduced by using methods which minimize trauma, pre-operative and postoperative emotion and pain, and by so doing conserve the energy remaining in the cells of the brain, the suprarenals, and the liver in patients in whom the stores of energy in their kinetic organs have already become depleted by the exhaustion due to the disease from which they seek relief.

To recapitulate: For the class of patients we have been considering, those handicapped by the exhaustion which is incident to pathological conditions of the liver and stomach, the ideal treatment comprises:

1. The pre-operative administration of sodium bicarbonate and glucose and of bromides *per rectum*. Morphin is contraindicated if acidosis is present or threatened.

2. Ether twilight anæsthesia or a light nitrous-oxide-oxygen anæsthesia.

3. A technique so accurate and so completely anociated by the use of local anæsthetics and gentle manipulations that but a small amount of the anæsthetic is needed.

4. As rapid a technique as is consistent with good work, that the period of anæsthesia may be as short as possible.

The clinical record upon which these conclusions are based include the histories of 893 operations on the biliary tract and 331 on the stomach performed by my associates, Dr. Bunts and Dr. Lower, by the members of my surgical staff at Lakeside Hospital and by myself.

"PELVIC INFLAMMATION"

By A. L. Lockhart, M.B. (Edin.)

Montreal

THE term "pelvic inflammation" covers such a broad field that the following remarks will be confined to those inflammatory processes affecting the Fallopian tubes, the ovaries, and the cellular and peritoneal tissues contained in the cavity of the pelvis.

This inflammation is caused by the invasion of organisms by (1) direct continuity through the vagina, uterus and tubes, (2) through the blood stream, (3) through the lymphatics, or (4) through the walls of the bowel. When the trouble has spread by direct continuity, the attacking organism is usually the gonococcus of Neisser, in which case the affection is most commonly bilateral. The other routes are followed—and these are named in the order of their frequency of occurrence—by the streptococcus, bacillus tuberculosis and bacillus coli, the latter being most often seen in a recrudescense of an old attack, where the bowel wall has been weakened, thus allowing of more ready escape of the microörganism.

Diagnosis. While one frequently has all of the tissues in the pelvis, viz., the tubes, ovaries, peritoneum and cellular tissue, synchronously involved, usually one structure or pair of structures is isolated for attack by the offending organism. It may be very easy, in the latter case, to make a differential diagnosis, but at times this is attended with the utmost difficulty.

One of the most perplexing cases is where you have inflammation on the right side of the pelvis and you must determine whether the appendix is at fault or the ovary or tube of that side. The history, if one can be obtained, will be of value in making a diagnosis. As an almost invariable rule, tubal disease is preceded by an attack of gonorrhœa, follows pregnancy, or else there is some focus of tubercular disease elsewhere in the body. Any vaginal discharge should be carefully examined for microörganisms, the finding of the gonococcus being strong evidence that you have to deal with a right-sided salpingitis. Gastric disturbance

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is usually much more marked in inflammation of the appendix than where the tube or ovary is affected. On examination of the abdomen, if the disease is appendiceal the point of maximum tenderness will be over McBurney's point, while if it is tubal it is lower and nearer to the middle line. At times, also, you have a tender point on each side of the middle line just below a line joining the two anterior superior iliac spines in disease of the appendages. Vaginal palpation of the mass is more difficult in disease of the appendix than of the tube or ovary.

The differentiation between inflammation of the tube and where this structure is the seat of gestation is more important than the above, in that the treatment of the two conditions is so radically different. One usually, and quite correctly, associates a subnormal temperature and a rapid, weak, thready pulse with ectopic gestation, but it must be remembered that, soon after leakage from a pregnant tube or its rupture, absorption begins, and this is almost invariably indicated by the rapid, bounding pulse and elevation of temperature of inflammation. This was well illustrated in the case of a woman who was admitted to the gynæcological service of the Montreal General Hospital several years ago. She was brought to the front door late one night and no history could be obtained. Her temperature was 103·2°, and pulse 120 beats to the minute and bounding in character. Her mucous membranes were a good colour. On making a pelvic examination, a very profuse muco-purulent vaginal discharge of a greenish-yellow colour was seen, the cervix was felt to be soft and the fundus was incorporated in a mass the size of a three and a half months pregnant uterus. The abdomen was tender over the whole lower third. As peritonitis was evidently present and the condition of the patient did not admit of delay, abdominal section was performed and revealed a ruptured gestation sac with some organization of the blood which filled the peritoneal cavity. Usually, however, oozing of blood from the uterus, a history of amenorrhœa or of hæmorrhage beginning soon after a menstrual period, and a steadily enlarging sausage-shaped mass, lying to one side of the uterus, will permit of a diagnosis of ectopic gestation. If still in doubt, the performance of a posterior colpotomy will clear up the question at once. If seen immediately after rupture, the case will present little, if any, difficulty in diagnosis.

Abscess of the ovary is a comparatively rare disease and usually follows the termination of pregnancy, either full term or premature. In such a case, the patient will probably progress very favourably for a week or ten days, when the temperature begins to rise, the pulse rate becomes increased and the patient experiences pain in one or other side. Examination will reveal enlargement of the ovary together with exquisite tenderness in that region. The ovary will steadily increase in size until it may be readily palpated through the anterior abdominal wall. This is a good example of the infecting organism travelling by means of the blood stream or lymphatic channels, as there is frequently no infection of the uterus, the germs gaining entrance to the system through a tear in the perineal body, and thence spreading up and outwards through the broad ligament to the ovary. Only very recently I operated upon the wife of a physician. She had suffered a complete laceration of the perineum at childbirth, repair of which was attempted but failed. Septic pelvic peritonitis resulted, and finally settled in a mass on the left side. This was treated by hot air with marked benefit but it would not resolve. On opening up the abdomen, this mass was found to be the left ovary which was the size of a billiard ball and which was embedded in a mass of adhesions. The tube ran over this and was simply somewhat hard and thickened. The organisms had here entered through the lacerated perineum and traversed the broad ligament to the ovary. When the cellular tissue of the pelvis is affected, it is usually as the result of infection during the emptying of the pregnant uterus. It may follow either a full term delivery or an abortion, especially when the latter has been brought about by artificial means. The onset is usually heralded by a chill, which is followed by elevation of temperature, increase in the rate of the pulse, which is full and bounding, pain and localized tenderness. The latter, at first, is spreading but later on becomes localized over the diseased area as a rule. On making a pelvic examination, a mass is to be felt within the cavity. This mass is hard, is confined to the base of the broad ligament or the side of the pelvis and its lower border is ill defined, the mass gradually fading away towards its lower and lateral aspects. The sensation which it imparts to the examining finger has been aptly compared to that which would be produced if plaster of Paris were poured into the pelvis. The upper surface, however, is well defined and rounded, being composed of inflammatory exudate, coils of intestine and the omentum, which usually tries to cover over, and thus limit, any inflammatory focus within the abdomen or pelvis.

While pelvic peritonitis is usually caused by the spread of the inflammation from one of the above-mentioned conditions, what may be fitly described as an "irritative peritonitis" undoubtedly exists. This form is seen to result from the escape of fluid into the peritoneal cavity where the uterus is perforated by a douching curette. It also may occur even in virgins where they expose themselves to cold, as by taking a cold bath or getting their feet wet during the menstrual period. Here one sometimes sees a reflux of blood from the uterus along the tube and so into the peritoneal cavity where it acts as a foreign body and thus sets up inflammation.

Finally, one may have a troublesome pelvic inflammatory mass arising from infection of blood clot left in the abdomen after an urgent operation for a ruptured ectopic sac.

The *prognosis* depends largely upon the nature of the attacking organism. When this is the gonococcus, the prognosis is good but it is much more grave when streptococci are present.

The mass may resolve completely, leaving the patient with a comparatively healthy pelvis. Pus, even, may be entirely absorbed but this happy termination is not very common. The sac may remain *in statu quo* ready to have the inflammation relighted on the slightest provocation. It may rupture into one or other of the adjacent cavities, such as the peritoneal cavity, the bladder, rectum, vagina or uterus, or else externally through the skin. In the case of one patient, recommended to me by the late Professor J. C. Cameron, cellulitis followed the delivery of a full-term child. When first seen, the mass was low in the base of the broad ligament and well to the side of the uterus. It gradually worked up between the layers of the broad ligament, under the fascia of the pelvis, until it lay entirely in front of the peritoneum of the anterior abdominal wall, incision through which permitted the escape of about 750 cc. of pus, drainage of the succeeding cavity being followed by cure.

The *treatment* of pelvic inflammation is the most important question to be considered. Fortunately, cases of pelvic inflammation, seen by the gynæcologist, rarely call for immediate operative interference, usually permitting one to wait until the acute process has subsided.

The routine treatment of patients admitted to the gynæcological wards of the Montreal General Hospital suffering from acute pelvic peritonitis consists, first, in making a thorough bacteriological examination of any vaginal discharge which may be present. The patient is kept at absolute rest in bed, often in the Fowler's position. Ice is placed over the whole of the lower abdomen and kept there. If the fornices of the vagina are not too tender, copious hot antiseptic vaginal douches are given twice daily, using but little force. The bowels are kept empty by using enemata whenever indicated. Occasionally the ice requires to be replaced by hot applications, but this is rarely necessary, the cold usually having the desired result of the relief of pain and congestion. If neither relieves the pain, morphine may be administered hypodermically, but this is only necessary for the first few hours during the time required for the ice or heat to take effect. When the patient is simply restless and not in much pain, a hypodermic of pantopon, given at night, is preferable to morphine, as it has a less deleterious effect upon the gastro-intestinal tract. The diet, of course, is to be of the lightest but most nourishing description, and it is frequently necessary to stimulate the patient by the judicious use of strychnine, either hypodermically or *per os.* The woman ought to be most carefully watched, and, if no improvement takes place in a few days, or she is perceptibly growing worse, operative measures must be considered. Where the mass is definitely pointing in one or other vaginal fornix, puncture per vaginam will be found of service. This, however, is not good surgery, if it can be prevented, as the sac always remains and will frequently give trouble later on, but it enables one now and then to tide a patient over the crisis and to build up her strength for more radical treatment later on. It is much better to open the abdomen and boldly attack the mass from above, removing the sac intact whenever possible. When this is attempted, it is well to make a good free incision so as to get well above the affected organ, in which case you can push the intestines up into the abdominal cavity, where they are retained by large abdominal towels, which also prevent any pus which may escape from contaminating the intestines. If possible, withdraw the pus from the sac by means of an aspirator before commencing its enucleation, thus rendering the operation a comparatively clean one. If any pus has escaped into the resulting space it should be wiped up gently with gauzes wrung out of 1 to 500 formalin solution, a portion of which may be left in the pelvis for a few minutes without the slightest fear of any harmful results. Unless the process is so acute as to indicate a very virulent organism or the peritoneal cavity has been considerably contaminated by pus, one may close the abdomen without drainage. If this is done and the patient placed in the Fowler position, the pelvic peritoneum can take care of a considerable number of microörganisms. If, however, the peritoneum has been soiled by virulent septic pus, puncture the posterior vaginal fornix and drain through the vaginal and abdominal incisions, using a rubber tube for the former and a cigarette drain for the latter. When the condition has settled down into a chronic state much may be done, short of operation to give the patient relief. The pelvic structures may all be matted together and yet may be restored to a healthy condition by appropriate local treatment. One of the worst cases of chronic pelvic peritonitis that I ever saw was in a woman who had been sterile for fifteen years after having given birth to two full-term children. Rest in bed, vaginal tampons, hot douches, applications of tincture of iodine to the vaginal fornices, together with the use of the galvanic current, so cleared up the pelvis that she became pregnant and gave birth to a fine boy. The course of treatment was a long one but the result was worth the trouble. In using hot douches for such a condition as this, many simply use one or two quarts of water. This is not giving this form of treatment a fair showing, as at least one gallon ought to be used twice daily, having the water decidedly warm. It is the warm moisture which causes the absorption which is aimed at, and not the antiseptic. During this treatment it is of course essential that the patient abstain from all sexual relations, as all causes of pelvic congestion cannot be too carefully avoided.

One of the most useful therapeutical agents in gynæcology is dry heat, which was first brought to my notice in a paper written in 1909 by Dr. George Gellhorn of St. Louis. Polano first suggested its use in gynæcology, and several methods of applying it have been devised but that introduced by Gellhorn is the best. His apparatus "consists of two semicircular cradles made of thin sheetiron and covered on the inside with asbestos. These two cradles lie one upon the other and may be pulled apart in the fashion of a telescope. On the inside of the free edges, eight electric light bulbs are attached and a long wire furnishes the connection with the nearest switch. A hole in the roof of the cradle is provided for the thermometer. The mercury bulb of the latter should be only three or four inches above the abdomen, so as to register the actual temperature of the air near the body, that in the upper portion naturally being warmer than that in the lower portion. If no thermometer is used, this hole may serve as a chimney through which the hot moist air can escape. There are also a number of hooks from which gauze bags filled with calcium chloride may be suspended in order to absorb any moisture within the air chamber." This apparatus is clean, light, perfectly safe and easily regulated, and can be used to apply heat to almost the whole body by simply drawing one cradle beneath the other.

Out of twenty-two cases of pelvic inflammatory trouble treated by me by non-operative measures since January 1st, 1913, the application of hot air to the abdomen has been the treatment carried out in fifteen, the cases being diagnosed as follows: chronic pelvic peritonitis, six cases; salpingo-oöphoritis, chronic, nine cases, acute, three cases; chronic pelvic cellulitis, four cases. The number of bakings varied from sixteen to seventy-four, the average being just under forty. The majority of women were baked twice daily for twenty minutes at a time. In very many cases, vaginal douching and tamponing and the application of tincture of iodine to the vaginal fornices were also practised. Two of the acute cases were treated by this method, but the acute condition was subdued first by the application of ice to the lower abdomen, rest in bed, etc., after which the hot air was applied. Only in two instances was the heat commenced while the temperature was above normal, and in neither case was any bad result noticed. In fact, one was showing no improvement after some weeks ordinary treatment, but as soon as the baking was commenced, the mass which had been present seemed to almost melt away. As for results, one patient was improving but left the wards against advice; three are noted as "improved," while eleven are put down as "well."

Most of the cases did not present any symptoms or conditions worthy of note, but the following may possibly be of some interest in the way of provoking some discussion. Before relating them, however, I wish to thank my house-surgeon, Dr. A. B. Walter, for his assistance in treating many of the above patients and in procuring information for this paper.

Case 1. Mrs. C., aged twenty-eight, was admitted to the Montreal General Hospital on January 17th, 1913. The history obtained was that she had been confined of a full-term child thirteen days previously. She had been running a temperature ever since the second day. On admission her temperature was 106°, pulse 120, and respirations 24. She had a severe chill just after entering hospital and was in a very bad septic condition. Her attending physician had given her several intra-uterine douches because the lochia were very foul. The abdomen was greatly distended by gas in the bowel, and in the right lower quadrant one could feel a rounded, tender mass the size of a large grape fruit. The skin was dry and harsh and the tongue foul and coated. A blood culture was taken but yielded negative results. An injection of 30 cc. of antistreptococcic serum was given in the evening, and by the next night the temperature was 98°, pulse 98, and respirations 24. At the same time 5 grains of collargolum were given *per* *rectum* and repeated every twelve hours for three doses. The temperature remained down for about three days and the patient steadily improved, but at the expiration of that time the temperature and pulse-rate again rose, though only to a moderate degree. In addition to the above, she was given an antiseptic vaginal douche twice daily, ice was applied to the abdomen and strychnine was administered hypodermically. The patient steadily improved but there was practically no diminution in the size of the mass, so that on February 20th the ice was discontinued and she was given the hot air bath for twenty minutes each day, with the result that the mass subsided so rapidly that on March 7th, i.e., fifteen days after the first air bath, she was discharged cured. At this time a pelvic examination was made, the uterus was felt to be pulled towards the right side, and a small mass was felt to the right of, and posterior to, the uterus, this subsequently clearing up. At the time of writing, the patient is two months pregnant.

CASE 2. Mrs. R., aged twenty-four, was admitted to the Montreal General Hospital on April 13th, 1914. She had been delivered at term in the country on April 5th, the labour being precipitate. The perineum was lacerated into the rectum and was stitched up at once. On the fourth day *post partum*, she felt chilly and the temperature ran up to 104° with correspondingly rapid pulse. Under appropriate treatment she improved, but here again a mass developed but on the left side. Ice and douching having failed to reduce this, hot air baths were commenced on May 6th, and given once daily until she was discharged on May 28th, the vaginal douching being kept up. At this date, the mass had markedly decreased in size until it was as large as a billiard ball, hard and not sensitive. Although the abdomen had to be opened and the mass removed later on, the hot air had a most beneficial effect in reducing the size of the mass, and was undoubtedly of great benefit. When removed, the mass was found to be an abscess of the left ovary and contained numerous streptococci of a very virulent type. This case was a good example of the imperviousness of an abscess wall to microörganisms, as during the five weeks which elapsed between her discharge from hospital and operation her temperature remained between 98° and 99°, except upon one or two occasions when she sat up in a chair.

This paper has been written principally to bring before you the beneficial effects of the application of hot air in cases of pelvic inflammation, and I hope that you will give the treatment a fair trial, as I am convinced that it will save many a woman from a dangerous and mutilating operation.

SOME ELEMENTARY FEATURES OF THE *X*-RAY DIAGNOSIS OF GASTRIC CARCINOMA, GASTRIC ULCER AND DUODENAL ULCER

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THE attitude of the profession toward the radiologic diagnosis of digestive tract lesions is a discordant composite of unwarranted faith and unwarranted skepticism. On the one hand are those who have a sublime but excessive confidence akin to that of the patient who believes that the radiologist can look directly into his innermost recesses and see all his lesions. On the other hand are the skeptics who abide with us always. Some of these are congenitally and hopelessly skeptical. Others have acquired their doubt from disappointing experience. Often they have expected too much from the Roentgen ray; sometimes their clinical opinion was not confirmed; sometimes they assumed that the *x*-ray should make a refined diagnosis without any other aid; sometimes the radiologist himself was not blameless. Extraordinary and unreasonable expectations on the part of the clinician, or the fear that the surgeon might find an undiscovered lesion, may have stimulated the radiologist to such excessive zeal that his imagination overcame his judgement, and a mistaken diagnosis resulted. The endeavour to satisfy inconsiderate demands from the physician or his patient is, to my mind, responsible for a vast amount of dissatisfaction with radiologic work.

The radiologic manifestations of gastro-intestinal pathology have various and fluctuating values. Some of them singly have almost pathognomonic importance. Others, taken alone, are much less conclusive yet are often strongly indicative in combination. Still others are merely suggestive, but worthy of inclusion in a general correlation.

In this work we encounter three varieties of stomach: the normal, the reflex and the pathologic, and the signs of these must be learned and distinguished from one another. Distinction of the pathologic from the normal is not very difficult, but distinction

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of the pathologic from the reflex is often troublesome. These reflex manifestations, which are commonly of a spasmodic character, occur frequently in association with disease of the gall-bladder or appendix, and occasionally in neurasthenia, tabes, intoxications, renal calculus and other conditions. They produce the most numerous and most deceptive counterfeits of pathologic signs, and their careful exclusion is always essential.

The *x*-ray examination of the digestive tract is not a mysterious art requiring unusual talents; but neither is it a simple procedure which can be learned in a day. It requires no more but no less patient effort, common sense, and industry than any other diagnostic method, and experience with sufficient material is indispensable for satisfactory work. Examinations must be thorough, findings must be recorded systematically for study, and cases must be followed to the operating room and the post-mortem table. I would strongly urge the radiologist to recapitulate and digest his records from time to time, in order that he may better learn the relative worth of his observations, and thus increase his diagnostic acumen. Under these conditions the radiologic examination of the digestive tract is of sufficient value to justify its routine employment. Its worth is shown by the fact that in our own considerable series of cases, definite signs were found in 93 per cent. of the gastric carcinomas, 83 per cent. of the gastric ulcers, and 50 per cent. to 60 per cent. of the duodenal ulcers.

Our technique, which has been altered slightly from time to time, is in essence a combined fluoroscopic and skiagraphic examination with a double opaque meal. The patient, having been purged with castor oil the evening previous, is given for his breakfast an ordinary portion of cereal containing two ounces of barium sulphate. Six hours later, having fasted meantime, he is examined with the screen, during which he is given two ounces of barium sulphate in eight ounces of water, followed by two ounces more in a pint of potato-starch pap, after which plates are made. By the test breakfast the motility of the stomach is determined, and a distinct residue after six hours is significant of impaired clearance, nearly always from organic cause. The purpose of the barium water is to fill any minute recesses and to visualize the pyloric canal and duodenum, while the pap, by holding the barium in suspension, outlines the entire stomach for screening and plating.

There are so many variations of the normal stomach that they may be learned only by experience. Each stomach fits the form of its possessor, and as persons vary greatly in their build, their stomachs show corresponding differences. However, a normal stomach may be defined roughly as of either steer-horn or fish-hook form, usually the latter, capable of emptying itself within six hours, its contour unbroken save by peristaltic waves and certain normal incisuræ, its tone sufficient to maintain a more or less tubular form, and its walls flexible and mobile to palpation. Its position is quite variable within normal limits.

The abnormal stomach manifests itself by alterations of form, contour, motility, peristalsis, mobility, flexibility, tone, and position.

GASTRIC CARCINOMA. The principal radiologic sign of cancer of the stomach is the filling defect, an irregularity of contour produced by the thrust of the tumour mass into the gastric lumen. Filling defects vary in size according to the extent of involvement, and they also vary somewhat in appearance according to the character of the cancer, the medullary type generally producing gross, mulitple, shaded, localized irregularities, while the scirrhous cancer often shows rather smooth but extensive narrowing of the gastric calibre. Though cancers may be seated in any part of the stomach, the majority are found in the pyloric portion. In these cases the pyloric end may be apparently obliterated by the growth, or the lumen may be reduced to a narrow spicule. An extensive filling defect in the mid-portion of the stomach may produce an hour-glass form, the canal joining the two segments being usually central, long and slightly irregular.

Filling defects must be differentiated from indentations caused by a gas-filled colon, adjacent extrinsic tumours, and by spasm. These conditions can often be determined by palpatory manipulation. Where spasm is suspected to be the cause of deformity, it may usually be relaxed by the administration of belladonna or atropine.

Alteration of the pyloric function in carcinoma may show itself in either of two quite opposite ways. The pylorus by reason of stiffening and infiltration or because of lessened acidity of the gastric contents often remains gaping, permitting a free and continuous flow of the opaque ingesta through it. In other cases pyloric obstruction, varying in degree with the size and situation of the tumour, is evidenced by a distinct residue from the six-hour meal. High-seated obstruction may result in dilatation of the esophagus from backing up of the ingesta.

In non-obstructive cases, hypermotility is commonly observed, the "head" of the six-hour meal being found in the transverse colon or farther, whereas under normal conditions it is usually seen at or near the cæcum.

The peristaltic activity of the carcinomatous stomach is markedly diminished, as a rule, although exaggerated peristalsis has been noted exceptionally in obstructive cases. In these cases, also, antiperistalsis has occasionally been observed. Interruption of peristaltic waves by carcinomatous infiltration is an important sign; the wave progresses to the affected area, skips over it, then takes up its course beyond.

Lessened mobility, as a result of the growth anchoring the stomach to adjacent structures, is an occasional finding. More important is the lessened flexibility of the infiltrated gastric wall, the palpating finger making little or no impression upon the gastric outline.

Syphilis of the stomach, though relatively rare, gives radiologic signs which are practically impossible to distinguish from those of carcinoma. Benign tumours are also occasionally but infrequently met with, and when found are usually in the pars pylorica. They produce filling defects similar to those of carcinoma.

Gastric Ulcer. The cardinal and practically pathognomonic signs of ulcer are the niche and the accessory pocket, showing as additions to the gastric contour, and representing the excavation produced by the ulcer. The niche is a bud-like, often minute, projection from the bismuth-filled lumen, lies wholly within the gastric wall, and is an index either of penetrating ulcer, or of a perforating ulcer which has not excavated an adjacent organ. The accessory pocket, sometimes loosely spoken of as a "diverticulum," is a pouch-like excavation resulting from extension of a perforated ulcer into near-by tissues, usually the liver or pancreas. Accessory pockets range in size from that of a filbert to that of a walnut, and may show as a miniature stomach with successive layers of gas, fluid and barium, and may retain barium after the stomach is empty. An accessory pocket in the liver moves with respiration, while a pocket in the pancreas does not. The latter also has a more posterior situation as shown by oblique view, and a wider excursion on rotating the patient.

Both the niche and the pocket are obviously signs of advanced ulcer, but ulcers are frequently found at operation which are not sufficiently extensive to produce an excavation that can be visualized on the screen or plate. Often these are mere mucous erosions or small slit-like crevices and their diagnosis can only be predicated upon less definite signs which are common to them and to the more advanced type. These signs, which have various degrees of value, both singly and in combination, include: (1) the incisura; (2) hour-glass stomach; (3) residue in the stomach after six hours; (4) pressure-tender point; (5) acute fish-hook form of the stomach with displacement to the left and downward; (6) lessened mobility; (7) hypotonus.

The *incisura* is a non-moving indentation of the greater curvature, opposite an ulcer, usually deep and narrow, but not always so. It is believed to be produced, at least in some cases, by the irritation of an ulcer or its scar causing a spasm of the circular muscle-fibres in that plane. Perhaps in some cases there is infiltration and stiffening of these fibres. A true incisura must be distinguished from the incisura cardiaca, a slight, shallow depression at the juncture of the cardia and media, from the wide but shallow incurvation often seen beneath the left costal arch, from peristaltic waves and from false incisuræ due to reflex spasm. A peristaltic wave, which progresses pyloruswards, would only be confounded with an incisura on the plate, and in the absence of a niche. False incisuræ sometimes travel and are sometimes stationary. Often they can be effaced by massage and they usually disappear after the administration of an antispasmodic. Hence the belladonna test should always be applied to suspected incisuræ. This test, however, is not absolutely conclusive for I have seen an incisura produced by a mesenteric adhesion-band which persisted in spite of the test.

Organic hour-glass stomach may occur, with or without the accessory pocket of perforated ulcer. It is imitated by reflex spasmodic hour-glass, which can usually be relaxed by belladonna.

A definite residue in the stomach from the six-hour meal is quite often noted in gastric ulcer regardless of its situation, but it is also found in many other conditions, notably carcinoma, duodenal ulcer, and disease of the gall-bladder and appendix.

A pressure-tender spot, definitely localized to the lesser curvature opposite an incisura is of considerable value. This combination of a tender point with an incisura is fair proof, even though no niche be present.

An acute fish-hook stomach, displaced to the left and downward, is occasionally seen in ulcer, but, in default of other signs, is of no value.

Lessened mobility is a sequence of perforated ulcer with adhesions, but is of little independent worth.

Hypotonous is often seen, but not invariably.

The worth of all these minor signs and their combinations depends upon the experience of the observer and their association with the clinical data.

Carcinomatous ulcers have practically the same signs as benign ulcers, and usually only the pathologist can determine the presence of malignancy. However, the radiologist should suspect malignancy when the ulcer crater is unusually large.

Duodenal Ulcer. While the radiologic indications of duodenal ulcer are numerous, their values are by no means equal. Some of them are rather peculiar to ulcer of the duodenum, others are only indefinitely suggestive. Accordingly, they may be divided into major and minor signs. The major signs are: (1) gastric hyperperistalsis, with or without a six-hour residue; (2) an accessory pocket of perforating ulcer.

Minor signs include: (1) gastric hypermotility with early free opening of the pylorus and rapid clearance of the stomach; (2) gastric hypertonus; (3) irregularities in the outline of the bulb or of the duodenum; (4) lagging of bismuth in the duodenum; (5) pressure-tender point over the duodenum; (6) reflex gastrospasm producing hour-glass contraction or transient incisura.

Gastric hyperperistalsis deserves especial emphasis as a practical and valuable sign of duodenal ulcer. When found in conjunction with a six-hour gastric residue it is almost certainly diagnostic. C. H. Mayo[1] remarks that a similar hyperperistalsis also occurs in the urinary bladder in cases of urethral obstruction. However, even in default of any duodenal obstruction, at least sufficient to result in a six-hour gastric residue, hyperperistalsis occurs in more than half the cases of duodenal ulcer, a frequency far greater than that noted in any other condition.

A six-hour gastric residue was found in over a third of our cases, as a consequence of duodenal obstruction from ulcer-scar contraction, but, unless accompanied by hyperperistalsis, this finding is no more significant of duodenal ulcer than of any other obstructive lesion. The combination of six-hour residue and hyperperistalsis occurred in 25 per cent. of our series.

Normal peristalsis, as observed with the technique previously described, commonly manifests itself in one or, exceptionally, in two pairs of waves of moderate depth traversing the pyloric portion of the stomach. The hyperperistalsis of duodenal ulcer is characterized by an increase of wave depth and number. Three or more pairs may be seen at once, and their field of activity covers the pars media as well as the pars pylorica. Both curvatures are equally indented and this symmetry of the contractions is a notable characteristic. As a rule the waves are orderly, succeeding each other at regular intervals, though occasionally in cases complicated by perforation or by invasion of the pyloric ring, some irregularity of succession or depth may be seen.

In the obstructive cases the waves may be so deep as to nearly segment the stomach whose configuration resembles a row of balls. But the hyperperistalsis is not merely compensatory to obstruction by duodenal stenosis, for we find exaggerated peristaltic vigor in the non-obstructive cases also, though of somewhat lesser degree.

In looking for hyperperistalsis as a sign of duodenal ulcer, certain facts must be kept in mind:

1. Immediately after drinking the barium-water mixture many patients show considerable peristaltic activity in the pyloric portion of the stomach, whether a lesion be present or not. This peristalsis usually soon ceases. The hyperperistalsis of duodenal ulcer is seen after filling the stomach with the barium pap.

2. After giving the pap the institution of peristalsis is often delayed for several minutes. Hence sufficient time should be given in suspected cases to permit this sign to appear.

3. By holding the abdomen rigid, or through fright or disgust for the meal, the patient may inhibit peristaltic action for a time. Therefore, he should be urged to relax his abdomen, and his fears should be quieted.

4. Hyperperistalsis may be more or less intermittent, periods of activity alternating with periods of quiet.

5. Hyperperistalsis may occur as a reflex from conditions other than duodenal ulcer, especially from disease of the gall-bladder and appendix, though far less frequently. In a recent recapitulation we found that hyperperistalsis was noted in 57 per cent. of the ulcer cases, 6 per cent. of the gall-bladder cases, and 3 per cent. of various other lesions. To differentiate from these latter conditions it is desirable to know the salient points of the clinical history, which in ulcer is strongly suggestive. We, therefore, routinely record the principal facts of the anamnesis prior to examination, and this serves the additional purpose of directing particular attention to the possibilities thereby suggested.

6. Hyperperistalsis with obstructive carcinoma or ulcer of the pylorus is seen far less commonly than might be supposed and when found is usually different from that of duodenal ulcer. The waves affect the greater curvature chiefly or exclusively, and, as a

rule, are disorderly in their depth and sequence. In these cases also, antiperistalsis is occasionally noted.

Wilkie[2] during the past three years, in the examination of four hundred and ninety cadavers, found forty-one cases of duodenal ulcer. In only six cases had the diagnosis been made *ante mortem*, and all of these had been operated on. He directs attention to what he calls "silent" ulcers, namely, chronic ulcers which during life had produced no typical symptoms, and which might result in perforation or death from hæmorrhage. These "silent" ulcers occur mostly in persons with arteriosclerosis and are usually found on the posterior wall. His statements are of particular interest as having a possible relation to a suggestion which I have previously advanced, namely that the absence of hyperperistalsis in some cases of duodenal ulcer may perhaps be due to the location of the ulcer.

The accessory pocket of perforating duodenal ulcer, which is similar to the pocket of perforating gastric ulcer, is quite decisive when found, but this is rare, occurring probably in not more than 1 per cent. of the cases.

Radiologists who make frequent examinations at intervals after the opaque meal has been taken have frequently called attention to hypermotility as an accompaniment of duodenal ulcer, the stomach often emptying, it is claimed, within two hours. With our routine technique it can be established that there is often a free flow through the pylorus at the time of examination and that the stomach in cases of non-obstructive duodenal ulcer is empty after six hours. Occasionally, the "head" of the six-hour meal will be found in the transverse colon or beyond, indicative possibly of hypermotility, but in a large series of cases the "head" of the meal will commonly be found in the cæcum—its usual position under normal conditions.

Hyperperistalsis should not be confounded with hypermotility. Other things being equal, hyperperistalsis would tend to result in hypermotility, but the most typical hypermotility is seen in cases of carcinoma and achylia where the peristaltic activity is subnormal.

Gastric hypertonus is a common but not invariable accompaniment of duodenal ulcer, yet it may exist quite independently of the latter. Hypotonus is observed occasionally as a result of obstruction and loss of compensation; but the maintenance of gastric compensation in the face of rather marked duodenal obstruction and for long periods, is a noteworthy phenomenon, contrasting strongly with the early dilatation consequent upon pyloric obstruction.

Deformity of the duodenal outline, especially of the bulb, has been industriously lauded as a pathognomonic sign of duodenal ulcer by radiologists who depend mainly upon plate findings for diagnosis, but I am quite unable to share their enthusiasm. I have encountered many cases in which such deformity was due solely to spasm, or to adhesions from a cholecystitis, or simply from a lack of sufficient opaque media to fill the bulb. In a recent paper,[3] I stated that "the degree of distension of the bulb and consequently the effectiveness of visualization will depend in part on the ratio between the amount of bismuth flowing through the pylorus and the rate of duodenal evacuation." Unlike the stomach, the duodenum has no distal sphincter to block immediate evacuation. The opaque meal coming through the pylorus into the duodenum is carried away without tensing the duodenal walls, at least to any considerable degree, except only in those cases with decided obstruction, and in these instances the bismuth is held proximal to the lesion. If by some simple and practical method the duodenum could be blocked beyond the ulcerous area, the latter might possibly be shown.

Pathologically, there is no difference between duodenal and gastric ulcers, except that the former are smaller, contain less scar tissue, are less likely to produce adhesions and practically never result in carcinoma. They may perforate or produce hæmorrhage just as do gastric ulcers. They have craters which, theoretically, should fill with the opaque meal and show as bud-like projections as do ulcers of the stomach, but I have never observed a niche in the duodenum, and I am not likely to, for there is no mechanism to retain the bismuth long enough in the duodenum to make the presence of a niche certain, and for this reason, even if seen transiently, it could not be differentiated from deformity due to spasm, irregular filling, etc. Further, any such niche would of necessity be smaller and much more shallow than the niche of gastric ulcer because the duodenal wall is much thinner than that of the stomach.

In this connexion it may be noted that Schlesinger[4] takes a similar stand. He remarks that if we were to depend upon the demonstration of anatomic changes in the duodenum for the diagnosis of ulcer, the *x*-ray examination "would be one of the most thankless tasks," and that functional changes in the stomach, especially hyperperistalsis, furnish us the weightiest indications of duodenal ulcer. Lagging of barium in the duodenum, whether in irregular patches or not, advanced some years ago as an index, is not peculiar to duodenal ulcer. A pressure-tender point over the duodenum may be noted with ulcer, but this can hardly be distinguished from a pressure-tender gall-bladder. Reflex gastrospasm with hour-glass contraction or transient incisura simply signifies an extrinsic irritation which may or may not originate in a duodenal ulcer.

References:

1. Mayo, C. H., Personal communication.
2. Wilkie, *Lancet*, May 23rd, 1914, p. 1465.
3. Carman, *Jour. Am. Med. Assn.*, March 28th, 1914, p. 980.
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A POST-GRADUATE school of neurology hes been organized by the neurological staff of the Philadelphia General Hospital. Instruction will be arranged in four periods of six weeks each, one, two, three or four of which can be taken by the students. The first course of six weeks commenced on Monday, December 7th, 1914, and will continue until the end of January. The second and third courses will be in February, March, April and May. Special short courses of two or three weeks each can be arranged for the months of June, July, August and September. The instruction will be given by the members of the neurological staff of the Philadelphia General Hospital and their assistants, and such well-known names as Dr. Charles K. Mills, Dr. Charles W. Burr, Dr. William G. Spiller, and others, are among those mentioned. The fees for each period covering all branches taught will be twenty-five dollars. Further information may be obtained from Dr. C. K. Mills, 1909 Chestnut Street, Philadelphia.

CONGENITAL DISLOCATION OF THE HIP

By Clarence L. Starr, M.D.

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THE tremendous development of surgery is nowhere better shown than in the advances made during the past two decades in the treatment of congenital dislocation of the hip. It is within the memory of most of the members present, that a patient afflicted with this defect was looked upon as a unique case, and caused only a flutter of excitement at the time of examination, and then was passed on as incurable.

Most of us recall the successful replacement after years of effort in the famous case of Dr. Buckminster Brown, of Boston. The uncertainty as to method attached to this case and the long and tiresome treamentt which it entailed, necessitated great courage on the part of both surgeon and patient even to think of attempting a cure.

Following this, Paci brought before the surgical world his successful treatment of this condition—which has been too often overlooked. Working almost simultaneously, Hoffa, then of Wurtzburg, and Lorenz, of Vienna, made an effort at the correction of this deformity by operative means, working largely on the assumption that the chief defect lay in a diminutive or defective acetabulum. The results of treatment by these surgeons, as a matter of medical history, are not very satisfactory. A great number of the cases became infected, a number of them with fatal results. This, however, gave the needed opportunity for the careful pathological study of the condition, and demonstrated that in the great majority of cases the acetabulum, while defective, was sufficiently formed to accommodate the head of the femur. It also gave the needed opportunity for the study of the general pathology of the condition, and as a result Lorenz developed his so-called "non-blutige" operation. This was simply the manipulation of the head into the more or less rudimentary acetabulum, fixing the thigh in the abducted position so that the head would not be dis-

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lodged, at the same time permitting a certain amount of weight-bearing—this latter being an essential factor in deepening the socket for the accommodation of the head of the femur.

Etiology. The etiology of the condition has been more or less a matter of conjecture, but of recent years it seems to be taking more definite form. It is now generally conceded that the head of the femur is displaced entirely by mechanical means. Le Damany, in a very interesting article on the subject, has pointed out that this type of deformity occurs only in the human fetus, and accounts for this by the doubled-up position necessarily assumed by the human fetus with the long thigh bones. The extreme flexion of the thighs *in utero* permits of pressure upon the lower ends of the femora, and this constant pressure, with the thighs in an adducted position, tends to make pressure upon the posterior portion of the acetabulum. This causes the socket to become more or less ovoid instead of the normal, rounded shape, the so-called creeping of the acetabulum. Specimens have been produced which show this defect rather characteristically. Along with this elongation of the socket, a certain degree of torsion or twist in the neck of the femur takes place, thus permitting the neck of the femur to ride upon the anterior margin of the acetabulum, producing the leverage which tends to throw the head completely out of the socket.

The rather interesting statistical statement is made also by Le Damany; that the luxation of the hips, in the northern part of France, is ten times more frequent than club-foot, and thirteen times more frequent than hare-lip: that the condition appears in more than one male in a thousand and in more than one female in two hundred of the population.

Pathology. As a result of post-mortem examinations and occasional dissecting-room specimens, with the assistance of the *x*-ray, the pathology of the condition has been fairly well defined. First, the bony changes show a shallow, irregularly triangular acetabulum with the base upward. This, as a rule, is not deep, and the over-hanging shelf of bone found in the normal acetabulum is practically never present. The depth of the cavity is usually filled with fatty tissue and some fibrous tissue. The head of the femur is more or less flattened and irregular in outline, and shows the ossification of the head undeveloped as compared with the normal. There is usually a distinct shortening of the neck with some torsion, the head being twisted anteriorily.

The ligaments show very definite and characteristic changes.

The capsular ligament, strengthened by the anterior pubo-femoral, is very extensively thickened in its upper part, and very much elongated. This portion of the capsule often attains a thickness of three eighths of an inch. The capsular ligament in its course from the margin of the acetabulum to the neck of the femur, especially in the older children, produces a marked constriction about its centre, forming a more or less hour-glass contraction. There is a fairly large cavity in the region of the head, and another in the region of the acetabulum, with this constricted area between. This is of very great importance in the consideration of the treatment of the condition. The ligamentum teres is very much attenuated, and often disappears entirely. It plays no part in the treatment of the condition, neither is it of any support at any stage. If the ligament should happen to be even moderately developed, it may coil up in the cavity in front of the reduced head and act as a sort of coil spring to prevent the head staying in its proper position. This, however, in the experience of the writer, is not of very serious or frequent occurrence.

Another factor which must be considered under the heading of pathology is the marked change which takes place in the muscles running from the pelvis to the femur. The most marked change is the shortening which takes place in the adductors. This, of course, is simply a matter of accommodation. The head of the femur being displaced backward and above its normal position, the muscles running from the pelvis to the femur naturally are shortened to this extent. The glutei are either unchanged or definitely lengthened by the greater distance which these muscles have to cover in their course from the dorsum of the ilium to their insertion in the great trochanter. The smaller rotators of the thigh are not markedly changed and play no part in the therapy of the condition.

Symptoms. The symptoms produced by such a pathological condition seem fairly obvious. As a rule, the defect is not recognized until the child begins to walk, and even then the waddle is sometimes overlooked because of the natural tendency of babes to an unstable type of gait in their early efforts at navigation.

In the unilateral cases, the difference in the apparent length of the femur on either side when the child is lying on its back, with the thighs fixed at right angles, should be easily noted, and probably would constitute the first symptom in the condition. When the child begins to walk, it is noted that there is a very distinct one-sided droop. The gait suggests at once the unstable character of the hip, because as soon as the body weight is put upon that side, the ligaments stretch and allow a certain amount of sinking of the trunk. This gives an absolutely characteristic waddle. If the condition is bilateral, it will, of course, be a double waddle. The gait is so unlike anything else, except coxa vara, that it ought to suggest the condition at once. Aside from the gait, there is marked lordosis, the pelvis being tilted forward, because the centre of gravity of the pelvis is changed by the backward and upward displacement of the femur.

In double congenital dislocation, the lordosis will, of course, be more marked, and the trochanters show very prominently in the region of the buttock, thus apparently exaggerating the lordosis. The slipping upward of the head of the femur on the oblique plane of the dorsum of the ilium, widens the distance between the two femora, thus showing a very distinct gap between the thighs. There is no interference with the movements at the hip because of the laxity of the ligaments. The patient may walk fairly long distances only complaining of being somewhat tired. It is also rather surprising that some of these cases with such a seemingly severe defect, are capable of so much exertion.

In the case of anterior displacement where the head lies under the anterior superior spine, the symptoms are not nearly so noticeable. There is practically no lordosis, and while there is some shortening, and therefore some drooping of that side in walking, there is not the same give and not so distinct a waddle.

DIAGNOSIS. The diagnosis is comparatively easy. The gait, as suggested before, is almost pathognomonic. The differential diagnosis is between congenital dislocation of the hip, coxa vara, and an old pathological dislocation due to septic arthritis of childhood, or possibly tuberculous hip-joint disease. The history of the condition ought to eliminate the pathological condition due to disease, and the diagnosis between coxa vara and congenital dislocation is made entirely by the fact that in the one instance the head can be felt definitely outside the acetabulum, and in the other case in its place. In coxa vara also, the rotation of the femur takes place with the head of the bone as the centre of the circle, the neck forming the radius, and the trochanter the circumference; while in the congenital dislocation the head is a less fixed point than the trochanter, and consequently on the rotation of the shaft of the femur, the trochanter acts as the centre of the circle, with the neck as the radius as before, and the head sweeps round as the circumference.

TREATMENT. In our experience at the Hospital for Sick Children, Toronto, about 75 per cent. of the cases under eight years of age can be reduced by manipulation, and a perfect anatomical and functional result obtained. In possibly a small percentage of cases the head is not retained in the acetabulum but slips forward as an anterior transposition, giving what may be called a functional cure but not an anatomical one, the chief defect being a small amount of shortening which necessarily remains.

In some 5 per cent. of cases it has been found necessary to make the reduction by operative means. The chief hindrances to the re-position of the head as found in such operation, has been the thickened and contracted condition of the capsule. By making a free crucial incision through the anterior portion of the capsule, a grooved instrument, similar in character to a shoe spoon, may be introduced, the end of the instrument reaching the margin of the acetabulum, and the head of the femur may be "skidded" along this hollow into the socket.

The manipulation as earlier described by Lorenz was of rather a severe character, and in the opinion of most of the surgeons doing a large practice of this type, mostly unnecessary. The method of treatment was forcibly to abduct the already flexed thigh, either tearing the adductor muscles from their attachment, or through the muscle substance, producing often a large hæmatoma, and occasionally tearing the obturator nerve. With the same severe trauma the extended leg is completely flexed on the body so that the limb lies almost alongside the trunk. Then with the limb over the edge of the table, the femur is hyper-extended—the object of all these high grade manipulations being to produce a marked flexibility at the hip. When this flexibility is complete, traction has to be made upon the thigh and forcible abduction. A V-shaped block is placed under the trochanter so as to act as a fulcrum, the shaft of the femur being used as a lever to spring the head over the posterior margin of the acetabulum into its socket. This re-placement of the bone usually takes place with a fairly distinct snap, so that there is no question about its reduction. The limb then is put up in plaster in what Lorenz calls the "frog" position, the thigh being extremely abducted and rotated outward, a plaster of Paris spica being applied to a point just below the knee.

This method has been largely modified by most of us, and the one adopted by us is to make less marked forcible abduction in an endeavour to produce as little trauma about the hip as possible, and it is usually found that the head can be successfully replaced without the preliminary extreme stretching advocated by Lorenz.

The limb also is put up in a position of moderate abduction and inward rotation, thus avoiding the difficulty of overcoming the subsequent extreme rotation of the limb.

A very necessary feature—and one which the writer would like to emphasize in the treatment of these cases—is the care subsequent to the reduction and the application of the plaster. It is essential in order to get a good functional result that the child be put upon its feet as quickly as possible. This is to encourage the bone growth and to prevent atrophy, and at the same time by the pressure of the head in the acetabulum to deepen the cavity and adapt it to the shape of the head of the femur.

In the cases of single dislocation, this is comparatively easy, as the child can get about with the one limb thus moderately abducted. In the bilateral, it is impossible of course for the child to walk, but some effort at locomotion can be attempted by making a special chair wide enough in the seat so that the child may sit astride it and just high enough so that the feet will touch the floor. If castors are put on a chair of this sort, the child soon learns to go about freely, and in this way gets a large amount of exercise.

In the original position of Lorenz, these plaster spicas had to be left on for from four to five months before being changed. In the modified position of abduction and internal rotation, the plaster may be changed in two months and the angle of abduction very markedly decreased, so that in the course of five to eight months the limb can be brought down parallel with its fellow.

The early results, as published by Lorenz, showed about 50 per cent. of cures. By the method adopted as described above, we have been able to produce anatomical and functional cures in approximately 75 per cent., and functional cures from anterior transpositions in about 10 per cent. Some 5 per cent. have been subjected to operative interference with good results, and the remaining 10 per cent. have been either unimproved, or have resulted in ankylosis.

THIRTY-TWO patients were admitted to the Brant Sanatorium, Brantford, during the past year. The total cost of maintenance amounted to $5,964.95 towards which sum a grant of $1,159.71 was received from the government.

OBSERVATIONS ON A SPOROTHRIX BEARING SOME RESEMBLANCE TO THE SPOROTHRIX BEURMANNI

By George E. Learmonth, B.A., M.D., C.M.

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DURING recent years there has been an increasing amount of investigation and of research on the subject of the cutaneous mycoses. Probably none of the diseases of this class is deserving of more attention than sporotrichial infection or sporotrichosis. Medical literature of the past few years, especially that of the United States and of France, is replete with references to this subject. In the former country mention should be made of the names of B. R. Schenck[1] who in 1898 discovered an organism in a case of intractable multiple abscesses of the hand and forearm which proved to be a fungus of the genus sporothrix or sporotrichum; of Hektoen and Perkins[2] who confirmed Schenck's find in 1900 and termed the organism *Sporothrix* or *Sporotrichum Schenckii.* Of the others who have contributed notably to our knowledge of the subject are Trimble and Shaw[3]; Stelwagon,[4] Pusey,[5] Hyde and Davis,[6] Sutton,[7] Hamburger,[8] and others. In France de Beurmann[9] has probably done more investigating and research than any other on this subject. In 1903 he reported having found a species of sporothrix differing materially in certain cultural and morphological characteristics from the sporothrix schenckii. In 1906 Matruchot and Ramond[10] experimenting with this fungus suggested that the term sporothrix beurmanni be applied to it. Investigation during the past three years has proven that the differences between the sporothrix schenckii and the sporothrix beurmanni are not great. As much controversy has arisen over this point I will allude to it later when I discuss the classification of the sporotricha. Other well-known French investigators on the subject have been Gaucher,[11] Monier-Vinard,[12] Jeanselme,[13] Gougerot,[14] Duval[15] and many others.

Up to the close of 1912 Hamburger[8] ascertained that reports of

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this disease came from fourteen of the States with a total of fifty-eight cases. In France up to this time there had been over one hundred recorded cases. From 1912 to the present many new cases have been reported in both these countries. In England I have found mention of only three cases, by Von Openheim,[16] Adamson[17] and Low.[18] Some of the American cases occurred in States close to our three prairie provinces, viz., in Minnesota, Dakota and Montana. Notwithstanding this fact no record is obtainable of its occurrence in the Canadian West, or for that matter anywhere in Canada. Hence one must conclude that either the disease is rarely met with here or that cases have passed by unrecognized. As its recognition depends in a great measure on cultural and on microscopical methods I am inclined to believe that if such methods are adopted sporotrichosis will be found to be not rarely met with. During the past three years since I have been on the lookout for the disease I have seen two cases.

CLINICAL MANIFESTATIONS.—According to the classification of de Beurmann[19] there are three main clinical forms:

1. Sporotrichosis with disseminated gummata: under this caption we have (*a*) the non-ulcerative form, (*b*) the form with large multiple abscesses.
2. Localized sporotrichosis in the form of a deep ulcerating gumma.
3. Extra-cutaneous forms affecting many of the viscera.

For several years the generally accepted belief was that the affection was purely cutaneous or epidermal in nature. This idea has been dissipated, just as in blastomycosis and other diseases of a granulomatous or fungoid character which further investigations have proved to be productive of a systemic involvement. This is evident in the cases reported in France, where muscles, bones (with osteitis and periosteitis), joints, the pharynx, larynx, lungs, kidneys, the conjunctiva, and the iris have been singly or otherwise involved. The sporothrix has been found in the sputum and in the blood occasionally causing a septicæmic sporotrichosis. In all of the American cases of which I have record with two exceptions the disease has been cutaneous, belonging to Class 1 of de Beurmann's classification. In the two exceptions mentioned the conjunctiva was affected; these were cases reported by Gifford[20] in 1910 and Wilder and McCullough[21] in 1914. There is little doubt but that when the disease is more fully studied in the United States and Canada as it has been in France, especially in the country districts where it is most prone to occur, visceral involvement will be found to be present. It is significant that horses, mules, dogs, cats, rats are readily infected. Added to this, the fact that experiment has shown that saprophytic growth may take place on vegetables and fruits is proof of the widespread occurrence of the mould. One further point I would emphasize, and that is the simulation which the disease occasionally presents to a syphilitic gumma or syphilitic ulcer which would deceive the elect, more especially since potassium iodide acts almost as a specific. In such cases a Wassermann test should be made. According to Cappani,[19] the so-called sporo-agglutination test of Widal and Abrami or the complement deviation test may be useful though both these are positive to other mycoses than soporotrichosis. Sutton[22] has called attention recently to its resemblance to blastomycosis. Tuberculosis of the skin is also with some difficulty differentiated.

A brief description of the average case reported in the States is as follows:

Infection usually occurs in a young male, most frequently a farmer or farm hand, with a history of a previous abrasion or injury to the skin surface. It begins with a small nodule about the size of a split pea, lying under the skin. About a week following the appearance of the nodule others appear in a line farther up the limb than the first. These tumours gradually harden and in a few weeks' time break down, discharging a small amount of brownish viscid pus. Ulcers are formed which continue to discharge. These are painless. There is usually no lymphangitis with enlarged glands.

In all of the American cases the organism of Schenck has been isolated, with the exception of the Hyde and Davis case. In 1912 de Beurmann and Gougerot compared cultures of the Hyde and Davis case with those of the sporothrix beurmanni They concluded that the Hyde and Davis cultures, if not identical with those of de Beurmann, were at least the connecting link between the sporothrix schenckii and the sporothrix beurmanni..

The sporotricha, according to recent classifications,[23] are placed among the hyphomycetes or fungi imperfecti which belong to the family of thallophyta, plants showing no differentiation into distinct parts as root, stem, and leaf. The fungi imperfecti are so termed inasmuch as their fruiting bodies have not been sufficiently studied.

I will present to you, as briefly as is consistent with the time allotted for this paper, the features of the Schenck organism, and then make a comparison with the sporothrix beurmanni.

SCHENCK'S ORGANISM.—Whilst the fungus is readily grown and observed in culture from the exudate, yet in the tissues it is with difficulty that it is discerned. According to Taylor, by using a modification of the Gram stain the organisms can be demonstrated at the periphery of the areas of necrosis. Taylor's method is to steam for one minute with the anilin methyl violet and counterstain lightly with alcoholic eosin instead of aqueous fuchsin.

Stained by this method the spores are typically cigar-shaped, often showing dark bands or having a granular appearance. There are often marked variations in the contours of the spores. The mould grows readily at room temperature and is ærobic. A profuse growth is obtainable on most of the commonly used culture media and is usually seen four to eight days following inoculation of the tubes. A small grayish-white, thread-like colony appears usually earlier on blood-serum and later on such media as agar-agar. On those media containing sugar the growth is especially prolific. Several colonies appear which gradually coalesce, forming an elevated, pale-gray layer which later becomes corrugated with a sticky soft surface. Cultures turn a dark brown after three or four weeks.

Morphology of the Spore.—The organism consists of an abundant branching septate mycelium, 1·5 to 2 microns in diameter, with clusters of pear-shaped spores. It stains well with all the basic dyes, and is not decolorized by Gram's stain. The organism grows by an elongation of the spore which usually divides in two. Buds push out from one or both of these new spores and grow rapidly, forming the mycelium which radiates from the centre. In young cultures one or two days old the germinating spores may be seen in large numbers. At one side of the spore a bulging of the wall occurs, marking the site of the growing filament which continues to extend rapidly and give off branches, which extend at right angles to the growing filament. I have drawn on Taylor's[24] article for much of this description of the sporothrix schenckii.

The main differences between de Beurmann's fungus and the above are as follows: (1) The presence of chlamydospores, or sac-like enlargements of the mycelium, containing spherical bodies. (2) The greater number and pedunculated nature of the spores borne on the mycelium. (3) The infrequent branching of the mycelium. (4) The lack of the parallel arrangement of the mycelial threads, characteristic of the sporotrichum schenckii. (5) The fermentation of saccharose.

From very close study and observation of both these sporotricha the views at the present time held by competent observers are that both forms are derived from the same stock, but represent different types. As cultural methods, such as the employment of the Saboraud glucose-agar culture, have much to do with the growth and morphological changes of the fungus, it is possible that both strains are identical.

Case Report.—The case which I now present with cultural and microscopical findings is as follows:

I was consulted December 16th, 1911, by E. D. S., male, aged thirty-one, married, farmer by occupation. He complained of a sore on the left arm.

History of Present Illness.—About one week to ten days previously he noticed a small, red, raised area about the size of a pea some two inches above the left wrist joint. This reddened area increased to the size of a ten-cent piece, broke down, discharging a brownish-yellow exudate, and the cavity gradually extended in depth and in width. There had been but very slight pain. The patient had always enjoyed excellent health. There is absolutely no history of any venereal infection. He is the father of four healthy children. His habits are good. There is nothing of interest in his family history.

General examination revealed nothing further than the local lesion on the left forearm.

About two inches above the left wrist joint on the inner surface, about three-quarters of an inch from the ulnar border, is a deeply-excavated, ulcerated area, about half an inch in diameter. The edges are raised above the surface, are not indurated, though firm, and are not undermined. There is a considerable amount of granulation tissue about the upper inner edge. The exudate is of a brownish-yellow colour. There is no pain complained of, nor is there apparently any tenderness on curetting the surface of the ulcer. Neither the epitrochlear nor the axillary glands are enlarged.

A smear taken from the exudate and stained with gentian violet did not show the short granular rods, which are usually demonstrated with difficulty. Cultures were taken on glucose agar, Löffler's blood-serum, broth, nutrient agar and nutrient gelatin, Having in mind chiefly the possibility of a sporotrichial infection, I left the tubes uncovered and at room temperature. On the fifth day I noticed a few small grayish-white growths on the glucose agar and on the blood serum. These gradually coalesced in each tube, forming a thick furry growth. At the end of some two weeks the cultures turned a dark brown colour. The growth in broth after about six days was noticed as fine flaky particles at the bottom of the liquid. The growths on nutrient agar and nutrient gelatin were not as profuse as on the blood serum and glucose-agar, appearing only about the seventh or eighth day.

MICROSCOPICAL APPEARANCES OF THE GROWTHS.—Numerous small round or ovoid spores of double contour are seen, and are a little more than half the size of a human red corpuscle. They have a refractive appearance, are of a slightly yellowish colour, and are arranged singly, in clusters and in chains of twelve to fourteen. Budding forms are seen, apparently the same as depicted by Hyde and Davis.

The mycelium is somewhat broad, jointed, branches freely, usually at an acute angle, and the ends of the branches are laden with numerous newly formed spores. In some of the older cultures large ovoid, almost cigar-shaped, forms are seen. Stained with mythelene blue, gentian violet, thionin blue, carbol fuchsin, the spores take the stain well. In the growing mycelium a darker band is seen extending through the mid portion of the spores. Stained by Gram's stain the organism is not decolorized. The mycelium does not take the stain as well as do the spores. Clear areas are seen about the central portion.

For further observations and advice I am much indebted to Professor Nicholls, of McGill University. He found that a better growth was obtained in the incubator than at room temperature, and that the organism was strictly aerobic, growing well on the various media which he tried, and did not produce gas or acid on glucose, saccharose, lactose and mannite broths. It grew well on plain and glycerinated agar, and blood agar, which gradually turned brown. Professor Nicholls also inoculated a mouse, but with a negative result. He identified the fungus as a sporothrix, but unlike the Schenck form.

I have concluded that this organism differs materially from both the Schenck and the de Beurmann types, though bearing a stronger resemblance to the latter.

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The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize of two hundred and fifty dollars will be made on July 14th, 1915, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. Essays for competition must be received by the secretary of the college on or before May 1st, 1915. Any subject in medicine may be chosen, but the manuscript must be typewritten and, if in any other language, must be accompanied by an English translation. Each essay must be sent without signature and must be plainly marked with a motto and accompanied by a sealed envelope having on its outside the motto and within the name and address of the author. The prize last year was awarded to Dr. H. B. Sheffield, of New York, for his essay entitled, "Idiocy and allied mental deficiencies in infancy and early childhood."

NOTES ON GLAUCOMA

By Percy G. Bell, B.A., M.D.

Winnipeg

THE subject of glaucoma is an interesting one to surgeon, physiologist and medical historian. The disease was known (though with little accuracy) in ancient times and a little consideration shows how terrible it must have been throughout the ages on account of its mysterious nature and dreadful results. The suffering and loss of sight which have been involved give it a very considerable rôle in the history of medicine.

Glaucoma to-day is a very important disease, occurring amongst every race and in every climate. Fuchs states that about one per cent. of all eye disease is a simple glaucoma. In this connexion local conditions are rather interesting. In the Winnipeg General Hospital in the year 1910 of 150 eye cases admitted for treatment 2·7 per cent. were diagnosed as glaucoma in some form. In 1911 a slightly greater number of in-patients gave the percentage as 1·9. It seems probable that eye clinics should yield a somewhat higher percentage now that improved methods of diagnosis, such as tonometry, are in vogue.

Within the last few years increased activity in glaucoma research has been productive of many new operations and of increased interest in the subject. The recent advances are brought strikingly to mind if one remembers that ten years ago glaucoma therapy was practically at a standstill, having progressed but slowly since the introduction of iridectomy as a curative measure nearly fifty years before. In the words of Priestly Smith, "The operative treatment of glaucoma has undergone more improvement during the last five years than during the previous fifty." With the practical application of the filtering cicatrix a fresh enthusiasm sprang up and the present activity is such that, as Elliot has remarked, "The present time may be spoken of in ophthalmological history as the 'glaucoma age.'"

As to the pathogenesis of glaucoma leaving aside the secondary

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Read at the Meeting of the Eye, Ear, Nose and Throat Section of the Winnipeg Medical Society, March 9th, 1914.

type of the disease where such gross lesions as adhesions of the iris, etc., are manifestly sufficient to cause a blockage of the filtration channels and a consequent rise of tension, what is the present opinion on the etiology of the chronic simple form? In spite of a considerable amount of recent work done on this subject in various parts of the world, it must be confessed that Priestly Smith's words, written years ago, still define our limitations. "Glaucoma is increased tension of the eyeball plus causes and effects." Risley, of Philadelphia, has recently contributed a thoughtful and suggestive inquiry (*Ophthalmology*, February, 1914) into the matter, in which he inclines to put the whole on the plane of a toxæmia. Various theories have been offered from time to time, such as the hypersecretion, retention and arteriosclerosis. At present we must feel that the final word remains to be said on the matter; there is no doubt that the causes of primary glaucoma are various and complex and the path to their understanding lies through continued research.

A word or two on some points of anatomy and physiology. It is apparent that tension of the eyeball depends upon the pressure within it and the elasticity of the walls. It has been found by analysis of fluid in the aqueous and vitreous chambers that it differs from the lymph in its relative poorness in proteins, richness in salts and absence of lymphocytes (Collins and Mayou). Injections of fluorescëin into the circulation have proved that the intra-ocular fluid is secreted by the ciliary body. It is a true secretion and not merely a transudation, and hence may be found at a higher pressure than the blood in the intra-ocular veins. In this relation some researches recently carried out by Craggs and Taylor in Elliot's clinic (*Ophthalmology*, June, 1913) are interesting. In order to establish whether there is any relation between arterial and intraocular tensions, the blood-pressure of seventy-five glaucoma patients was carefully taken. The conclusion reached was that high arterial tension is not a necessary or even leading factor in the etiology of glaucoma. Parsons in his monograph on the "Ocular Circulation" deals with several important physiological facts. He points out that while the branches of the ophthalmic artery enter a closed box (the eyeball) in the same way as do the arteries entering the cranium, yet there is this important difference, that the walls of the former are not rigid, but that the eyeball may be changed in form, within limits, by forces acting from within and from without. Under normal conditions the contents of the globe exert a pressure of between 20 and 30 millimetres of Hg. above the atmospheric pressure, so that the ocular vessels are subjected to about that extra pressure on entering the eye. According to Starling, the capillary pressure in most parts of the body is about 15 to 20 mm. Though we have no means of measuring the ocular capillary circulation in man, yet it is apparent that to overcome the normal pressure, the capillary pressure must be far above 20 to 30 mm., and we will probably be not far wrong in considering it equal to 40 to 50 mm. Thus it would seem that it has the highest capillary pressure of any organ, at rest, of the body. The various efferent channels of the eye act as a system of filters. The main channels are the lymphatics of the central artery, the crypts of the iris, communicating with the iritic veins and, chiefly, the channels at the angle of the anterior chamber which discharge into the canal of Schlemm and its affiliations. Any pathological change which reduces the effective lumen of the parts of this system, or any alteration in the consistency of the aqueous, tending toward making filtration more difficult, will of course tend towards production of high tension in the eyeball.

A short consideration of the instruments used in diagnosis may be of interest. It would be idle at this meeting to remark upon the value and scope of such instruments as the ophthalmoscope and perimeter—they are associated with any idea of glaucoma. The question of tension immediately suggests the tonometer. It has long been felt that the old method of recording tension by the finger was not exact enough. Not only would the judgement of equally capable observers differ, but it seems fair to suppose that it would vary in the same observer, from time to time, for various causes. One has seen, in a large clinic, the different opinions on degree of tension recorded by a dozen men in examination of the same eye. Then in some cases of chronic glaucoma it is just the slight rise that is so important, especially in interval examinations, and here the fingers are not exact. Elliot, speaking of this matter, says of his clinic: "The feeling amongst us is that one might just as well guess at a patient's temperature by passing one's hand over his skin as estimate his ocular tension by the finger method alone." There are various tonometers on the market. Of those employed by direct contact with the eyeball, that invented by Professor Schiötz, of the University of Christiana, is probably the most widely used. It is a delicate instrument, carefully made and easy of use and its readings can readily be made in mm. Hg. by use of a simple chart. It has been widely used in Europe and America for the past three or four years. Other tonometers which are employed over the closed lids have not enjoyed much popularity. As to what constitutes normal tension, most observers seem agreed on about 23 to 27 mm. Hg. A tension of 30 to 40 would probably correspond to the sign T ? in the old method. In a few cases of chronic glaucoma simplex one has found a reading of about 60 mm. Hg., where probably T + 1 would express the result. The tension of an eye is not the same as the intra-ocular pressure, though the two are intimately related. Transillumination of the eye has been practised for some years past. In 1884 Lange described a method whereby he focussed a gas-flame, by means of a lens, on the sclera, after the pupil had been dilated with atropine. Sachs in 1903 and Würdemann (1908) invented electric lamp transilluminators. At first the method was used solely for diagnosis of intra-ocular tumours but lately has been employed for inspection of the condition of the tissues of the filtration angle in glaucoma. Contributions have been made by several investigators but it seems yet a little too early to dogmatise on the value of the results. There would appear to be a useful though limited sphere for the fundus camera in glaucoma work. In certain cases of simplex a series of photographs showing condition of the optic nerve and vessels, from time to time, might easily prove of service. The apparatus is, however, very expensive and could be maintained only at the large centres.

In any attempt at an estimation of the new glaucoma operations, it is necessary to understand a little of the history of the subject. First, to go far afield, let us go back to one of the early oculists, George Bartisch, of Königbruch, in 1583. His opinion of his art comes down to us somewhat as follows: "Every oculist should be an honest and God-fearing man and should have studied Latin and the anatomy of the human body, especially that of the eye." In 1728 William Cheselden, surgeon to St. Thomas', London, performed the first operation for establishing an artificial pupil, and it was not until seventy years later that Joseph Beer performed the operation of iridectomy, practically as it is known to-day. Von Helmholtz in 1851 helped to place ophthalmology on a firm footing by the discovery of the ophthalmoscope, and five years later von Graefe, who has frequently been called the founder of modern ophthalmology, applied iridectomy to the relief of glaucoma. In the course of time examination of a large number of pathological specimens operated upon, showed that those in which the drainage was through a cystoid cicatrix were the most successful. In 1901 De Wecker made a report to the French Ophthalmological Society on the results of producing an intentional incarceration of the iris and Parinaud in the discussion which followed, stated that he had endeavoured to make filtering scars after iridectomy by the same method. The conviction was slowly gaining ground that though the classic iridectomy was the best operation for cases of acute glaucoma, it left much to be desired in the chronic form. As the result of this the new glaucoma operations were gradually introduced, the object in all, irrespective of method, being to produce a slow permanent escape of aqueous. In 1903 Herbert published an analysis of 130 cases showing his results by leaving prolapsed iris in the scleral wound. He found the results more satisfactory than those obtained with simple iridectomy. Later he introduced his wedge-isolation operation (a modified sclerotomy) and has still further modified this lately by a triple incision subconjunctively through the sclera—the aim being to procure some shrinking of the scleral wedges on healing and consequently filtering cicatrices which communicate between the aqueous and the subconjunctival lymph spaces, in other words a sort of circulation anastomosis. Bishop Harman has modified this operation by performing the sclerotomy with twin scissors, and many similar modifications have been made.

All the different operations now in vogue aim at producing a filtering cicatrix in one of three ways: (1) by the entanglement of iris or other tissue in the wound; (2) by forming the wound in such a way that it tends to remain patent; or (3) by excising a portion of the tissue in some manner.

Heine, of Breslau, in 1905 introduced the operation of cyclodialysis. An incision was made with a straight lance-knife in the sclera a few millimeters outside the limbus and then a spatula was introduced through the wound into the anterior chamber, breaking through the ligamentum pectinatum, the object being to form a communication between the anterior chamber and the suprachoroidal space.

In 1906 Lagrange, of Bordeaux, brought forward his operation for sclerectomy, which is too well known to need any description. He recommends it in cases of chronic simple glaucoma. If the tension is low no iridectomy is done, but if it is higher, say roughly within the limits of +1 to +3, the combined operation is performed. Lagrange's operation is in very great favour on the Continent. The basic idea of a sclerectomy seems to be largely to this operator's credit.

On August 2nd, 1909, Lt.-Col. Elliot, I.M.S., of Madras, performed his first trephining of the eye. A similar operation had been performed two months earlier by Dr. Freeland Fergus, of Glasgow, but the latter combines a cyclodialysis. Elliot has had a large experience in his clinic, nearly 900 cases having been operated upon. His object has been to form a permanent drainage between the anterior chamber and the sub-conjunctival space. He believes that trephining a disc of sclero-cornea (1·5 to 2 mm. diameter) at the limbus after reflection of a large flap of conjunctiva, and his manœuvre of "splitting the cornea", fulfil the need of drainage, with at the same time the minimum of traumatism to the eye. A small iridectomy through the trephine hole is done. Elliot's careful statistics show that he has had remarkable success. That in this and other operations, there is truly a filtering cicatrix left is shown by the spot of conjunctival œdema which persists at the site of operation. Elliot trephines in cases of both acute and chronic glaucoma, in glaucoma secondary to cataract, in staphyloma, conical cornea and glaucoma secondary to leucoma adherens or occlusion of the pupil, etc., considering it a superior operation to simple iridectomy. In Elliot's recent book on the subject, full details are given of the methods of diagnosis, operation and after-treatment, as well as articles by various authorities on the historical and comparative considerations of the different recent operations. Trephining is in the main a simple operation but its success depends on minute attention to detail. For example, Elliot's success—his percentage of failures (to 1913) being given as 4·6 only—seems to be due to extremely careful working up of his subject and the greatest attention to every step of operative technique and after-treatment, added to which is, of course, exceptional operative skill.

In 1912 at Moorfields, one saw that Elliot's operation had almost entirely superseded that of Herbert. Wallis, late senior house surgeon of the hospital, has contributed an interesting paper on the results of trephinings carried out by the different members of the staff, several of whom had departed somewhat from Elliot's exact routine. Out of ninety-one patients suffering from primary chronic glaucoma, the case percentage of failures was 9·8, while the operation percentage of failures is 15·3.

Amongst other recent operations for glaucoma I should just like to mention Bettremieux's simple anterior sclerectomy, where thin shavings of the sclera are removed with the idea of producing an anastomosis between the deep scleral and superficial conjunctival vessels. Abadie's ciliarotomy is also worthy of notice. This operator, believing that certain cases of glaucoma are due to the irritation of the ciliary nerve plexus, endeavours to produce an "anti-glaucomatous reaction" by division of the nervous circle. It is not necessary to dilate upon the time-honoured posterior sclerotomy either as an operation *per se* or as a forerunner to iridectomy or other surgical interference.

Any comparative estimate of the various new operations is, at present, extremely difficult. Last year at the 17th International Congress of Medicine in London, Priestly Smith communicated the results of an inquiry he had instituted amongst members of the Ophthalmological Society of the United Kingdom. Three questions were asked as follows:

"What operation or operations, if any, do you at present perform in place of the classical iridectomy, and with what advantages, (*a*) in acute primary glaucoma; (*b*) in chronic primary glaucoma (glaucoma simplex); (*c*) in congenital glaucoma (buphthalmos)?"

One hundred and twenty answered, and the following is a brief abstract of the replies: (*a*) In acute primary glaucoma iridectomy was still in use by 101. There were various methods of iridectomy. Nineteen combined posterior scleral puncture with the operation. Trephining was adopted by nine. (*b*) In chronic primary glaucoma, iridectomy is now habitually practised by only thirty-one out of the 120. Herbert's "trap-door" operation has seventeen adherents. Trephining is now decidedly the favourite operation, it being placed first with fifty six. (*c*) Concerning buphthalmos, thirty-three of the 120 are silent; amongst the others, some are gloomy of any results, while others pin their faith to iridectomy, Herbert's operation and trephining.

In comment the author says, "Further experience will doubtless bring further change of practise . . . . but it is unlikely that any one method will ultimately exclude all others. On the contrary, it is likely that better knowledge of causation will lead to a discriminating choice of different methods for different forms and stages of glaucoma. Improvements in the operative treatment, however great, can never dim the lustre of von Graefe's great achievement. He cured a disastrous malady that had never been cured before."

A HOSPITAL has been opened at Juneau, Alaska, by the Sisters of St. Ann, at a cost of $60,000.

Case Reports

CARCINOMA OF THE BREAST IN A MAN WITH APPARENTLY HEALED MILIARY TUBERCULOSIS

By L. Bruce Robertson, B.A., M.B.

Toronto

THE following case was thought of sufficient interest to report on account of the uncommon pathological conditions present at the same time.

R. W., an American aged sixty years, night watchman, was admitted to the First Surgical Division, Bellevue Hospital, New York, on September 26th, 1912. His complaint on admission was rupture, and local examination at the time revealed the presence of a right inguinal hernia. One sister had died of pulmonary tuberculosis. One daughter is living and in good health. One died in childhood following chronic bone disease, but the patient could not state whether it was tuberculous or not. He denied venereal disease, and had been a moderate drinker up to thirty-five years ago. The history relating to his hernia was vague, and he could not state definitely the time of its appearance. When questioned as to a tumour which was present in the left breast, he stated that some sixteen years before, he had noticed several blisters over the chest, one of them being in the region of the left nipple. The etiology of the blisters was unknown. Various sorts of treatment were indulged in, and the lesions elsewhere than in the left nipple disappeared. Very gradually a tumour formed, invading the left nipple, and increased in size very slowly. The tumour was painless, but occasional pains had been noticed in the left shoulder. There had been no noticeable discharge from the affected nipple, and no glandular enlargement had been noticed in the left axilla. There was no history of trauma to the left breast.

His general health had been fair, and there was no history of any serious illness. A slight cough had been present for some time but had not bothered him to any extent, and he had never noticed any bloody sputum.

Physical Examination: Patient is a fairly well developed, only fairly well nourished man, about sixty years of age. He has a somewhat stooping figure, though the posterior spinal curvature is not usually round. There is a slight arterial thickening, the heart sounds are clear, and the apex beat not displaced. The lungs show slight impairment of resonance at both bases posteriorly, and a few râles are present in this situation. The abdomen is flaccid and not distended, no masses can be left. The liver edge is palpable. The spleen cannot be felt. The inguinal glands on both sides are palpable and somewhat indurated. The axillary glands on both sides are moderately enlarged, discrete and painless, no enlargement is present in the epitrochlear or supraclavicular glands.

There is a hard painless tumour in the left breast surmounted by and involving the nipple. The tumour is the size of an hen's egg and stands out prominently from the surrounding tissue. The top of the nipple is occupied by an irregularly lobulated mass of somewhat soft dark red tissue, covered by a thin hairless epithelium very similar to that of the normal nipple. The skin for a short distance about the nipple is somewhat reddened and is adherent to the apical portion of the tumour but not towards the base of the latter. The tumour has no firm deep attachments. A right inguinal hernia is present, the sac descending well down into the scrotum.

A sciagraph of the chest showed no lesion of the vertebræ, and only such decreased radiability of the bronchial glands as might be expected in a man of his age.

On the day following admission the left breast was removed and the left axillary glands cleaned out, a small area being left to granulate after approximating the skin flaps. The report from the pathological department showed the breast tumour to be a medullary carcinoma; the axillary glands showed only miliary tubercles.

Two weeks later the inguinal hernia was operated upon. At the operation the wall of the hernial sac was seen to contain numerous small seed-like bodies, some soft and white, others hard and fibrous. On this account some of the adjacent inguinal glands were removed for examination. On microscopic examination both the hernial sac and the inguinal lymph glands showed miliary tubercles.

One month after admission the patient was discharged from the hospital, the breast wound being represented by a small area of healthy grandulations, and the hernia wound having healed by primary union. About five weeks later he returned to the hospital saying that in the last week or so a small swelling had appeared beneath the hernia wound and that it was steadily increasing in size. Examination showed a superficial fluctuating swelling just beneath the hernia wound and some induration of the surrounding tissues, giving all the appearances of a tuberculous abscess. The patient's temperature and pulse were normal. The swelling was painted with a 7½ per cent. solution of tincture of iodine, covered with sterile gauze wet with 95 per cent. alcohol, and an ice-bag applied. The abscess was allowed to rupture spontaneously into the sterile dressing, and after the latter was removed three days later a dry scab had formed over the abscess opening. A sterile dressing was applied and the patient sent home at his own request. The breast wound by this time had healed altogether, except for a small area of granulation tissue.

Nothing further was heard from the patient until July, 1913, when in answer to a letter as to his condition he replied that there were two soft and somewhat painful masses in the left axilla, one of which had been discharging a considerable amount of pus for about a month. There was some limitation to the abduction of the arm. There had been slight but persistent discharge from the abscess which had occurred in the right inguinal region, but he thought that the sinus was about to close. His general health was good. He had had no cough, and had worked most of the time since leaving the hospital.

The possibility of tuberculosis of the breast was considered but the sections showed no miliary tubercles and the tumour cells showed only malignant characteristics. It is possible that the wide-spread distribution of the tubercles in the left axilla and the right inguinal glands and peritoneum, can be accounted for by a condition whose existence is not altogether accepted, namely miliary tuberculosis with recovery.

For the opportunity of reporting this case, I wish to express my thanks to Drs. John B. Walker and Arthur Vosburgh of the First Surgical Division of the Bellevue Hospital.

The staff of the Vancouver General Hospital has voluntarily agreed to a reduction of from 5 per cent. to 10 per cent. in their salaries, in order to help the board through the present financial crisis. The deficit for the year 1914, to the end of October, is reported as amounting to $11,811.75.

Editorial

A CHIROPRACTICAL JOKE

IN dealing with the bony heretics in our midst it is difficult to find the golden mean. The shortest way savours of persecution to a not uncommon type of mind. Hale him—osteopath, chiropractic, or *Eddyot*—before the judge, if the legal definition of "the practice of medicine" permits it, and the yellow-minded reporter is there to hail him before the public as a martyr to the greed of corporate interests. On the other hand, the present policy of *laissez-aller* is not free from danger to the laity and, in many districts, harm to the profession. Incidentally, it may be questioned whether the usual formula, "give him enough rope and he will hang himself," can properly be applied to one who is clever enough to make a living by replacing and keeping in place undislocated vertebræ. When, therefore, this sorry sect a few months ago proposed to establish a teaching school of "chiropractics" in Toronto, the Ontario College of Physicians did well to protest vigorously to the government, and it is to be hoped for the credit of the province that official sanction at least will be withheld.

Recently in a wide-awake little town in Ontario an ingenious attempt was made to deal with the local problem. If it failed of the desired effect, the unforeseen factor was one that has often caused the best-laid schemes to gang agley. One of the leading practitioners of the town was called in to see a young woman, whom he found to be seriously ill with diphtheria. He prepared to give antitoxin, but the patient and her people, with the obstinacy of fanaticism, would have none of it. Dr. Merrythought, having exhausted his powers of persuasion, if not of profanity, washed his hands of the case and departed to report it to the medical health officer, his friend Dr. Sly. Thereupon the parents sent for Quackanbosh, a particularly offensive "chiropractor" who had recently settled in the town. His first visit occupied only the time necessary to replace the cervical vertebræ and unobstruct the flow of vital spirits along the nerve roots. His second visit was more protracted, lasting without interruption for a period of some three weeks. Our friends had hit upon this visit as an opportune moment for placarding the house and establishing a rigid quarantine!

So far the laurels rested with the profession; but Quackanbosh has some claim to the last laugh. It was indeed to be expected that the patient would recover. Such cases do; and for much the same reason that Montreal, having drunk more than its usual allowance of sewage lately, has fortunately been more than usually free of typhoid. But that was not all. Quackanbosh did not waste his leisure in repining. As the apothecary poet puts it, "They could not in the self-same mansion dwell without some stir of heart." He emerged from his pleasant captivity betrothed to the young lady, and is now more firmly rooted in the town, without further let and hindrance on the part of Drs. Merrythought and Sly, who were among the first to give their services to the Empire. They are now at the front, where one may hope that even as non-combatants their strategic faculties will find scope, and be attended with a less dubious success.

APPENDICULAR OBSTRUCTION

ONE of the puzzling features of acute appendicitis has always been the extraordinary variability in the nature and severity of the early symptoms. An interesting contribution on the pathogenesis of the disease, and one which may be of considerable clinical importance, has been made by Mr. D. P. D. Wilkie, of the Edinburgh Royal Infirmary, in a paper published in the *British Medical Journal* of December 5th.

While others have laid stress on the obstructive factor in appendicitis, he maintains that there are two clinical entities to be clearly differentiated, primary inflammation and primary obstruction. "If we set out by recognizing two definite types of acute disease of the appendix—namely, acute inflammation and acute obstruction—then not only does the understanding and the teaching of the symptomatology of acute appendicular disease become much simplified, but the early diagnosis of such disease becomes inevitably more confident and more correct." The destructive features of acute appendicular obstruction as contrasted with primary inflammation are, briefly, the great severity of the pain, the suddenness of its onset, and especially the absence of disturbance of the pulse and temperature during the initial stages. Vomiting is usually but not always present. The commonest causes underlying the obstruction are fibrous stenosis, resulting often from a previous appendicitis, and acute kinking by an abnormal band or fold, congenital or acquired. The immediate cause of the acute symptoms is the access of fæcal matter to the distal portion of the appendix beyond such a constriction.

These views are not based on clinical and pathological observations alone, but are supported by a series of suggestive experiments, which were carried out on cats, and in which an isolated loop from the lower end of the ileum was used to form an artificial obstructed appendix. The results of these experiments confirm those previously obtained by Heile, who found that when the appendix in the dog was occluded, the degree and rapidity of the morbid changes were in direct proportion to the amount of fæcal matter present. Moreover, in Wilkie's experiments not only the amount of the fæcal matter, but its nitrogenous character, seemed to have a very definite influence. If the animal had been fed on a meat diet, complete gangrene of the artificial appendix, without the blood supply being interfered with, would quickly ensue, sometimes within sixteen hours. In this connexion statistics are quoted to show that the prevalence of appendicitis in any class or race of people is in proportion to the amount of animal proteins that enter into their diet.

The experimental results are compared with conditions found in the human appendix, and a plausible case is made out for the author's claim that acute obstruction of the appendix should be regarded as a pathological and clinical entity, a form of intestinal obstruction to be distinguished from acute inflammation because the obstructive cases demand treatment before the signs of inflammation appear.

An interesting case bearing on this question was reported by Dr. C. C. Waller, of Vermont, in the *Journal of the American Medical Association* of September 5th. It concerned a child who had had repeated attacks of severe pain in the region of the appendix. During the operation, on delivery of the apparently normal appendix, and while the anæsthesia was not very deep, the patient began straining with considerable energy, and to the operator's surprise the appendix gradually inflated to a degree near bursting. Under gentle pressure the organ was deflated and then removed. A no. 6 bird-shot was found occluding the orifice of the appendix, which was otherwise free from any indication of inflammatory changes.

IMPERIAL RECIPROCITY

THE question of reciprocity between the medical licensing bodies of Great Britain and Ontario, to which reference was made in these columns two months ago, gives promise of reaching a satisfactory settlement. It was felt by some that, in view of the emergency which exists, and if only as a matter of courtesy, the General Medical Council of Great Britain might be in a position to relax its regulations so as to allow, for instance, a physician licensed in Ontario to practise temporarily with the British Red Cross. This has not been found practicable. Meanwhile the College of Physicians and Surgeons of Ontario has taken action, and at a meeting of the

Council of the College, held on December 22nd, it was unanimously agreed that the legislative committee should obtain from the Ontario Government at its next session the powers necessary to enable the College to reëstablish reciprocal relations between the Ontario Council and the General Medical Council of Great Britain. It seems reasonably certain that any disadvantages which might possibly result to the profession in Ontario will be more than outweighed by the removal of the anomalous restrictions on the patriotic activities of some of its members, to which the present situation has called attention.

THE present war has made it necessary to suspend publication of the *Revue de Médecine* and the *Revue de Chirurgie.* At the close of hostilities, however, publication will be resumed and the numbers due for 1914 will then be sent to subscribers. As soon as it is possible to do so, the periodicals will appear under the same conditions as before.

ACCORDING to reports in the daily press, there is a great deal of smallpox in the neighbourhood and city of London, Ontario. It is stated that children suffering from the disease have been allowed to attend school and that thus the infection has spread throughout a wide area. It is suggested that failure on the part of physicians in attendance to report cases is largely responsible for the present condition of affairs. An investigation is being made by Dr. Bell of the provincial board of health.

The amendment recently made to the Municipal Act as affecting hospitals in the province of Saskatchewan excites some comment. The amendment provides that a municipality shall care for any sick person who has been resident there for at least thirty days and who is unable to procure necessary medical attention. If the patient is received by a hospital, however, payment by the municipality is made contingent upon the fact that the patient was admitted to hospital on the request of the municipal council, the reeve, or the secretary. The amendment applies to country districts only where distance often makes it impossible for a sick person to go to any municipal officer. In case of sudden illness, a hospital could not refuse to admit the patient even though he had not received permission from a municipal officer to enter the hospital and yet the hospital would be unable to obtain any remuneration from the municipality to which the patient belonged. The matter has been brought to the attention of the government and it is understood that the wording of the amendment will be changed at an early date.

THE first of our Canadian practitioners to give his life for the cause was Dr. Fernand Louis de Verteuil, of Vancouver, a notice of whose death appeared in the JOURNAL of November. He was a surgeon in the Royal Naval Reserve, and joined the ill-fated cruiser *Good Hope* in August. Dr. de Verteuil belonged to a family well known in the West Indies, and had held a position in the Trinidad medical service before settling in Vancouver. He studied medicine at Edinburgh and at King's College and St. Thomas's Hospital, London. He took the M.R.C.S., L.R.C.P., Lond., in 1904, and the degree of M.D. at Edinburgh in 1909. Dr. de Verteuil was the author of several papers dealing with tropical diseases, including an article on leprosy which he contributed to the JOURNAL. He was the translator of Maisonneuve's "Experimental Prophylaxis of Syphilis." His loss will be felt by the Association, in whose welfare he took an active interest.

A LIST showing the losses suffered by the medical services of the German army has been published in the *Wiener Medicinische Wochenschrift.* The total casualties up to November 16th are given as 287, of whom 94 were killed, 12 died, 27 were prisoners, and 64 missing. No such figures seem to have been issued up to the present from the allied armies. In the first British casualty lists, especially those covering the famous retreat, the proportion of R.A.M.C. officers killed was astonishing. In one long list 10 per cent. of the officers killed were medical men. Since September, however, the proportion has, fortunately, not seemed unduly large. With regard to the prisoners, one reads of complaints, emanating from both sides, that surgeons and Red Cross officers captured are being wrongfully detained. According to the Geneva Convention such prisoners may be held as long as there are prisoners of their own nationality requiring their professional care.

An ancient projectile in a new form has made its appearance in this ultra-modern war. This is the steel arrow, which has been dropped, sometimes in veritable showers, by the aeroplanes of the Allies upon groups of astonished Germans. The arrow is about five inches long, the lower third being solid and tapering to a sharp point, while the upper two-thirds, composing the shaft, are flanged. Dropped from a height of fifteen hundred yards they reach the ground with a velocity equal to that of an old-fashioned bullet, and that they are capable of inflicting serious wounds is shown by the accounts of German surgeons. In one instance such an arrow entered the supraclavicular fossa and came out at the knee!

A bacteriological investigation of the milk supply of Montreal was undertaken in 1913 by Dr. F. C. Harrison, principal of Macdonald College, Dr. A. Savage, and Mr. W. Sadler. The report, which has recently been issued, is comprehensive and the result of careful and conscientious investigation. A study was made of the manner in which the milk was produced, transported, and retailed to the city of Montreal;

and the authors aver that the results of these studies are "set forth with nothing extenuated nor aught set down in malice." The report is of particular interest in view of the great mortality among infants in Montreal, equalled only by that of Chili, and the conclusions reached by the authors are far from encouraging. The milk, both in summer and winter, is branded as *bad*—of very poor hygienic quality. "It is grade D milk, milk which should not be permitted for sale, and which would be unhesitatingly condemned by any city with even a low standard." In considering the causes of such conditions, the authors are of opinion that too little incentive is offered to the farmer to keep his milk clean and sanitary, for, unlike all other farm produce, which is paid for in accordance with its quality, milk is not graded and a pure milk brings in no more to the farmer than does milk in the production of which no care has been exercised. The price of milk, as compared with other foodstuffs, is considered too low and the farmer's remuneration inadequate. The evils of transportation, often in open cars in the hot weather, the ignorance and negligence of dealers, and the lack of care in the treatment of utensils, are all taken into account and the report closes with an earnest plea that certain amendments be made to the legal statutes of the province of Quebec and the regulations and by-laws of the city of Montreal, in so far as the sale and distribution of milk is concerned.

A School of Tropical Medicine has now been established in connexion with the hospital of the Calcutta Medical College. The foundation stone was laid February 24th by Lord Carmichael, governor of Bengal. The opportunities for research of course will be enormous and a large amount of clinical and pathological material will be available. It is proposed to give a course of instruction of five months' duration in contradistinction to the two or three months course given in the English schools.

Book Reviews

DISEASES OF THE SKIN, INCLUDING THE ACUTE ERUPTIVE FEVERS. By FRANK CROZER KNOWLES, M.D., Instructor in Dermatology in the University of Pennsylvania; Clinical Professor of Dermatology, Women's Medical College of Pennsylvania; Fellow of the College of Physicians of Philadelphia, etc. Octavo, 546 pages, with 199 engravings and 14 plates. Cloth, $4.00, net. Lea & Febiger, publishers, Philadelphia and New York, 1914.

We can readily agree with the publisher that the most striking feature of this new work is its series of large and clear illustrations, most of which are drawn from the original. The book deals with every eruption of the skin and contiguous mucus membranes, including the exanthemata and the eruptions which occur in the course of the various fevers. The directions for treatment are quite specific and extremely full,—a feature which is not always emphasized in text-books. Dr. Knowles has had a large and varied experience. He has been closely associated with such masters of skin diseases as Duhring, Stelwagon, Van Harlingen, Hartzell, and Davis. He has written an admirable text-book: plain in text and clear in illustration.

LOCAL ANESTHESIA: ITS SCIENTIFIC BASIS AND PRACTICAL USE. By PROFESSOR DR. HEINRICH BRAUN, Obermedizinalrat and Director of the Kgl. Hospital at Zwickau, Germany. Translated and edited by PERCY SHIELDS, M.D., Cincinnati. Octavo, 399 pages, with 215 illustrations in black and colours. Cloth, $4.25, net. Lea & Febiger, Publishers, Philadelphia and New York, 1914.

Within the past two months three books on local anæsthesia have reached us, and of the three this one is the most important—perhaps the most important which has yet been published. It is a translation by Dr. Percy Shields of Dr. Brown's well-known work done from the third edition. The advantage of local anæsthesia as compared with general anæsthesia in its convenience and absence from mortality have long been recognized by surgeons;

but the practice is not so simple as it seems, and there is a wide choice of methods to be employed. The directions in the textbooks on surgery are insufficient, and the various monographs lay too much stress upon the method with which they deal. It is in the various specialties, such as ophthalmology, otology, rhinology, gynæcology, and urology, that local anæsthesia has found greatest favour; but the effect of this book will be to enlarge the usefulness of the method. Coming from a German the comparison of the "hard and gruesome Middle Ages" with "the modern world of culture" reads strangely now. Professor Brown says quite truly: "We cannot compare the atrocities of the Middle Ages with our conception of pain." Everything pertinent to the subject is contained in this book, and it comes as a pleasant surprise that some Germans at least are interested in the alleviation of pain.

A TREATISE ON DISEASES OF THE NOSE, THROAT AND EAR. By WILLIAM LINCOLN BALLENGER, M.D., Professor of Laryngology, Rhinology and Otology in the College of Physicians and Surgeons, Chicago. New (4th edition), thoroughly revised. Octavo, 1080 pages, with 536 engravings, mostly original, and 33 plates. Cloth, $5.50 net. Lea & Febiger, Philadelphia and New York, 1914.

During the past six years in successive editions, until now the fourth is reached, Professor Ballenger's treatise on Diseases of the Nose, Throat, and Ear has made its way steadily to the front. In that place it is now finally established. This formidable volume of 1280 pages contains a record of the best practice in the specialty with which it deals. Nothing that is of value in the old or the new teaching is omitted. Upon the labyrinth alone there are over a hundred pages of new matter, and the most modern of the operations are illustrated by twelve diagrams. The occasion of the present revision has been seized to make a searching review of the whole subject. Among other new matters may be mentioned the full description of Mosher's fronto-ethmoid operation, with five drawings, showing each step. Autogenous vaccines in the treatment of hay fever are given place, though this remedy has not fully proved its value. Otosclerosis has been extensively revised. Haynes' operation on the cisterna magna is fully described, and five drawings illustrate the technique. Vaccine therapy has been revised, and the His Leukocyte-extract therapy is given in detail. It forms a valuable advance in the treatment of certain forms of infectious diseases, especially of the nasal sinuses and meninges. Meningitis has been largely rewritten. The section on Abscess of the Brain has been revised by Dr. Howard Charles Ballenger. The use of salvarsan in the treatment of syphilis of the brain and auditory nerve is described with great fulness and forms an important addition to this edition.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

CHEMISTRY AND TOXICOLOGY FOR NURSES. By PHILIP ASHER, PH.G., M.D. Price $1.25 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

A MANUAL OF DISEASES OF THE NOSE, THROAT, AND EAR. By E. B. GLEASON, M.D. Third edition, thoroughly revised. Price $2.50 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents, The J. F. Hartz Company, Limited, Toronto.

ABDOMINAL OPERATIONS, Volumes I. and II. By SIR BERKELEY MOYNIHAN, M.S., F.R.S.C. Third edition, revised; illustrated. Price, cloth, $10.00 net; half morocco, $13.00 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

A LABORATORY MANUAL OF QUALITATIVE CHEMICAL ANALYSIS. By A. R. BLISS, JR., M.D., PH. G. Price $2.00 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

Res Judicatæ

SAVING THE TEETH

MUCH attention has been given of late, and with excellent results, to the question of conservation of natural resources, forests, water powers, etc. It is comparatively easy to arouse interest with resulting action when the possible loss is stated in dollars. But it is a very different problem to arouse interest in health matters and yet the loss here may be comparatively as great. What may be anyone's business is nobody's business. Nothing illustrates this more forcibly than the question of the care of the teeth. How much this means for the health of the individual needs no argument. We are slowly realizing how often conditions of the teeth and mouth (oral sepsis) are responsible for disturbances in the digestive tract and for many disease processes elsewhere, such as arthritis and endocarditis. In almost any locality, but more especially in the rural districts, only slight observation is required to prove how common serious mouth infection is and how few persons have reached adult life with good teeth. I was particularly impressed by this in the Eastern provinces, but in no province or state is there any difficulty in seeing the same thing.

That this should not be is very evident. The problem has been realized and is being met in many of the larger cities by careful attention to the teeth of school children. But this goes but a small way in remedying this evil. It is in the rural districts particularly that reform is needed. How can the problem be attacked to the best advantage? There seem several points which may be considered.

1. Education of the profession. We should lead in any effort to improve public health, but too often we do not. The problem of conservation of teeth and care of the mouth might well be taken up by medical societies with the hope that more might be done than passing resolutions and appointing committees. Those of us who are teachers should not let any student go out lacking a knowledge of the importance of mouth infection. We should investigate the state of the mouth and teeth in every patient and impress the necessity of care on them. For young children the importance of this should be impressed on the parents.

2. Education of the dentist. Surely, you say, they do not require education in anything pertaining to the mouth. But this is just what many of them do require, for the majority are apparently ignorant of the importance of mouth infection and how to treat it. Many of us know how unsatisfactory it is to refer a patient to a dentist for pyorrhœa alveolaris. He often returns with the statement that it is due to too much acid and that nothing much can be done for it. There are some dentists who do their best to educate the public and who devote themselves to this work, but there seems no good reason why everyone who practises dentistry should not be able to do it. There is no desire to disparage the dental profession; we are in the same boat with them in our neglect of this subject. Only a few weeks ago I saw a man in Ontario who had pyorrhœa. He lives in a large town, but there was not a dentist there who could or would treat his condition and he had to make a long journey to Toronto for treatment. Naturally he was not likely to persist in going often enough for good results. There must be something wrong in the teaching. To send out dentists trained in the prophylaxis and treatment of mouth infection would seem much more important to the community than to equip them to cap teeth and make plates, useful as these are. More prophylaxis would result in less need of repair dentistry. In fact the perfection of the technique is often responsible for trouble, as in the case of capped teeth. There is often a process of infection about them and in my experience it is difficult to get the majority of dentists to realize this. In the past week I have seen two cases of arthritis apparently secondary to such a process of infection.

3. Education of the public. Here it is the old story of catching them young. The child who learns to care for the teeth at any rate has some chance of reaching adult life with a clean mouth and good teeth. The school teacher should be instructed how to bring the matter before the children. Such a campaign as this would require the coöperation of the Department of Education in each province. If the provincial medical societies took the matter up seriously it should be possible to bring it before the proper departments. Money would be well spent in supplying dental supervision to all schools. There is a story going the rounds of an Englishman who wished to enlist, but was rejected on account of bad teeth. He remarked that his object was to shoot the enemy and not to bite them. He did not realize that soldiers with bad teeth would be more likely to be ill and less efficient in the field than those who could chew any kind of food.

Improvement requires both concerted and individual effort. Education for both the profession and public is necessary. There should be a large field for the dentist who is willing to devote himself particularly to what may be termed prophylactic dentistry. The medical profession should be eager to realize such effort and support it by referring patients to such a man.

Fortunately there are simple measures which we can adopt and which are often of considerable benefit. The first essential in treating mouth infection is to ensure proper brushing of the teeth and gums with a suitable toothbrush. With this the use of floss silk between the teeth is advisable. After this a saturated solution of sodium silicofluoride or one per cent. hydrogen peroxide can be used as a mouth wash. The local application of tincture of iodine to the infected areas is of undoubted value. The use of these can be taught to any patient. The proper methods of brushing the teeth and using the silk require demonstration. Hospitals can help by teaching mouth hygiene to every patient who enters a public ward. Some of them will profit by the lesson.

T. McC.

A VERY satisfactory report on the health of the city of Saskatoon has been furnished by Dr. Wilson, the medical health officer. During the first ten months of 1914, the birth rate increased from 30 to 33·56 per thousand, and the death rate fell from 14·82 to 10·20 per thousand. The number of cases of infectious disease was materially less than in 1913, and whereas in 1913, 145 deaths occurred amongst infants only 87 were reported during the period under consideration. Twenty-four cases of typhoid were reported, two of which were fatal, whereas in 1913, 51 cases and 11 deaths occurred. Diphtheria is an exception, the cases reported numbering 44 as compared with 19 in 1913. The increase, to some extent, is attributed to the change in the regulations concerning the notification of this disease.

Obituary

Dr. Edward Rolston Langrill, of Toronto, died October 13th, at the age of thirty-nine. Dr. Langrill had been in poor health for some time. He was a graduate of Trinity University, receiving the degree of M.D. in 1900.

Dr. Susan Grace Dougall, of Montreal, died December 5th, in the sixty-third year of her age. After studying medicine at Edinburgh University, Dr. Dougall practised in Philadelphia and New York; for the past seven or eight years she had resided in England. Dr. Dougall took an active part in many philanthropic and charitable works.

Dr. W. L. Gaboury, of Pembroke, Ontario, was killed instantly while driving across a railroad track.

Dr. Solomon Singer, of Toronto, died October 19th, in the thirty-eighth year of his age. Dr. Singer was educated in the public school of Toronto and at the Harbord Collegiate Institute; he graduated from the University of Toronto in 1903 and the following year received the degree of M.D. He then did some post-graduate work in the New York hospitals and returning to Toronto, commenced to practise there. Dr. Singer leaves a widow and two children.

Dr. John Closson Ray, of Toronto, died October 17th. He received the degree of M.D. from Victoria University in 1862.

Dr. Calvin Shaw, of Cleveland, Ohio, died October 12th. Dr. Shaw formerly resided in Toronto; he graduated from Trinity University in 1895.

Dr. Frederick Frank, of Orangeville, Ontario, died November 25th, in the seventy-fifth year of his age. Dr. Frank was born in the township of Caledon; he had resided at Orangeville for more than forty-five years. He leaves a widow, one son, and one daughter.

Dr. H. Martel, of East Angus, Quebec, died suddenly

November 23rd. Dr. Martel was twenty-eight years of age and had been in practice at East Angus for some years. He leaves a widow, four sons, and one daughter.

Dr. A. M. Rosebrugh, of Toronto, died November 26th, in the eightieth year of his age. Dr. Rosebrugh was born at Branchton, near Galt, in 1835. He graduated from Victoria University. In 1863, the free dispensary in Toronto was reopened, largely through the efforts of Dr. Rosebrugh; he organized the Toronto Eye and Ear Infirmary, and was a member of the Prison Reform Commission of 1890. When he first began to practise, Dr. Rosebrugh's interests were chiefly centred in ophthalmology and medical electricity; later he devoted a large portion of his time to reform work of various kinds and the care of the feebleminded. His widow, four daughters, and three sons survive him.

Dr. Nathaniel Osborne Walker died at Woodhouse, Ontario, on November 25th. Dr. Walker was born at Woodhouse in 1832; he was educated at Upper Canada College, afterwards entering the University of Toronto where he received the degrees of B.A., M.B., M.A., and M.D., the latter in 1859. Dr. Walker then studied in England and became a member of the Royal College of Surgeons. On his return to Ontario, Dr. Walker went into practice at Vittoria and, in two years' time, removed to Port Dover. About thirteen years ago he went to Los Angeles and there practised for three years, when failing health compelled him to relinquish his professional work. At the time of the Northwest Rebellion, Dr. Walker was in charge of a base hospital. He is survived by four sons and three daughters.

Dr. Kempshall, of Ingersoll, Ontario, died December 3rd, at the age of eighty-seven years.

Dr. Hillier Noel Coutlee, of Sharbot Lake, Ontario, died at the Kingston General Hospital, December 8th, in the fifty-eighth year of his age. Dr. Coutlee was born in Ottawa, and in 1881, graduated from Queen's Medical College.

Dr. M. D. Sudworth, of Ingersoll, Ontario, was found dead near Guelph on December 3rd. Dr. Sudworth had been at Blind River for several months assisting another young doctor there; he graduated only last year and was about twenty-five years of age.

Dr. William Higginbotham, of Brantford, Ontario, died December 15th, in the sixty-seventh year of his age. A graduate of Queen's University, Dr. Higginbotham first went into practice at Omemee whence he removed to Brantford.

Dr. Llewellyn Brock, of Guelph, Ontario, died December 11th. Dr. Brock was born in Guelph and graduated in medicine from Toronto University. He then returned to his native city where he practised for many years.

News

MARITIME PROVINCES

Scarlet fever has been prevalent for some months past in certain communities in Cape Breton County. The disease has assumed a very severe form and in several cases has terminated fatally.

The St. John County Hospital for Tuberculosis at Little River, New Brunswick, is almost completed. It consists of a main building and two wings.

Dr. T. A. B. Addy, of St. John, New Brunswick, has been elected a Fellow of the American College of Physicians and Surgeons.

ONTARIO

One hundred and fifty cases of diphtheria were reported in Berlin during the twelve months ending October 31st, 1914. Nineteen deaths occurred,—that is a case mortality of 12·6 per cent., or 10 per cent. per thousand of population. The disease has been unusually prevalent in various parts of the province during the past few months.

Dr. G. L. McDougal has been appointed medical officer of health of Harriston, in succession to the late Dr. H. R. McCullough.

An epidemic of measles is reported from Goderich. Under date December 12th, it was reported in the daily press that the schools and churches were closed and that there were in the town at least seven hundred cases of the disease.

THE two cottages which have been added to the Mowat Memorial Hospital, Kingston, are now completed. They were built with the proceeds of a legacy left by the late Mrs. Nicol.

DURING the year ending October 31st, 1914, 137 deaths from tuberculosis were reported in Ottawa, whereas but 107 cases of the disease had been reported by physicians. In common with other parts of Canada, diphtheria has been unusually prevalent in Ottawa, there having been reported 614 cases and 60 deaths. One hundred and nineteen cases of typhoid and 13 deaths, and 45 cases of smallpox were reported. During the early part of the year scarlet fever of a severe type was prevalent; the number of reported cases throughout the year was 344 and 29 deaths.

THE new wing of St. Luke's Hospital, Ottawa, was formally opened on Tuesday, December 8th, by Their Royal Highnesses the Duke and Duchess of Connaught. The building was given by Mr. J. B. Booth; the furnishings of the men's wards were given by Mrs. L. B. Seybold, and those for the women's wards by Mr. and Mrs. John Lumsden. Each ward contains twenty beds.

DR. W. E. STRUTHERS, of the Toronto department of education, has been appointed chief medical officer of the Workmen's Compensation Commission. The Compensation Act came into force at the beginning of this month.

DR. ALEXANDER MCKAY has been appointed chief medical officer of the public schools of Toronto, in succession to Dr. W. E. Struthers.

A BUST of the late Dr. Emily Stowe was presented to the city of Toronto on October 29th, having been subscribed to by friends of Miss Stowe, the first woman to practise medicine in the province of Ontario.

DURING the week ending December 5th, sixty-seven cases of chicken-pox were reported in Hamilton.

QUEBEC

The governors of the Montreal General Hospital have guaranteed an amount sufficient to enable the hospital to continue its work for the next three years. The Notre Dame and Western hospitals will also be kept open, at least for some time to come, notwithstanding the present financial stringency.

SASKATCHEWAN

The new wing of the Regina General Hospital is now ready for occupation. No formal opening will take place, but the accommodation will be used as required. The wing is four storeys high and each storey is provided with balconies. For some time past the older portions of the hospital have been overcrowded and the extra accommodation will be very helpful.

BRITISH COLUMBIA

A wing has been added to the Chilliwack Hospital. The new addition consists of two storeys and measures twenty-five by forty-five feet. The accommodation of the hospital has been almost doubled.

It is announced that Dr. Arthur G. Price, of Cowichan Station, near Duncan, has been appointed medical officer of health for South Cowichan, to succeed Dr. Watson Dykes.

MEDICAL COLLEGES

Manitoba University.

The Faculty of the Manitoba Medical College has decided to raise the standard of the medical matriculation examination. Beginning with the session 1915-1916, all students must have standing equivalent to that of the first year in the science course in Manitoba University. Medical matriculation in Manitoba, therefore, now consists of a junior matriculation, divided into part 1 and part 2, really the same as the old junior and senior matriculation, and a senior matriculation which is the same as the first year science examination. This step probably will be followed in a few years by another that will again raise the standard.

The total number of students in medicine enrolled for the session 1914-1915 is one hundred and seventy-six. The freshman class numbers forty, including four women.

The following are the additions and changes to the staff of the Manitoba Medical College: Dr. W. L. Watt has been appointed lecturer in roentgen rays and electrotherapeutics; Dr. Boyd professor of pathology; Dr. R. D. Fletcher lecturer in genito-urinary diseases; Dr. Hugh Mackay lecturer in dermatology; Dr. T. Herbert Bell lecturer in clinical ophthalmology; Dr. G. W. Fletcher lecturer in clinical otology and laryngology; Dr. D. S. Mackay lecturer in clinical gynæcology; Dr. J. D. McQueen lecturer in materia medica and pharmacy; Dr. A. T. Mathers lecturer on contagious diseases; and Dr. J. A. Gorrell demonstrator in anatomy. Dr. J. O. Todd has been appointed lecturer in theoretical surgery in place of Dr. B. J. Brandson who has resigned, and Dr. E. S. Moorhead has been appointed lecturer in theoretical medicine to succeed Dr. W. Chesnut, resigned.

The war has called away a number both from teaching staff and students. Among those who have joined the Army Medical Corps of the first and second contingent of the Overseas Expeditionary forces are Dr. W. L. Watt, Dr. F. C. Bell, Dr. T. H. Bell, Dr. W. Webster, and Professor Boyd. Dr. George W. Treleaven, one of last year's graduates, will accompany the second contingent as an officer in the Sixteenth Field Ambulance.

McGill University.

THE offer made by the medical faculty of McGill University to supply the personnel of a general hospital has been accepted by the War Office and by the Canadian Department of Militia.

Dalhousie University

THE appointment is announced of A. G. Nicholls, M.A., M.D., D.Sc., F.R.S.C., to the chair of pathology and bacteriology at Dalhousie. Dr. Nicholls was assistant professor of pathology at McGill University. Dr. Nicholls was born in Durham, England. He studied at McGill University and graduated in medicine in 1894.

ARMY MEDICAL SERVICES

DR. R. A. HUGHES, of Swift Current, Saskatchewan, has been appointed lieutenant in the Imperial Royal Army Medical Corps and has left for England.

DR. W. E. HOME, of Victoria, has offered his services to the British Admiralty and has left for England.

Dr. J. A. Montgomery, of Deloraine, Manitoba, has joined the British Red Cross with a view to active service. The degree of L.R.C.P. and S. was recently conferred upon Dr. Montgomery.

No. 2 Stationary Hospital, which accompanied the first Canadian contingent, has been established at Le Touquet, near Boulogne. The hospital is in charge of Lieutenant-Colonel Shillington and included in the personnel are Drs. Scott, Quebec; Rudolph and Goldsmith, Toronto; Dillon and McLeod, Ottawa; McKay, Montreal; Cockburn, Sturgeon Falls; Wilson, London; Alwyn Smith, Winnipeg; Tyler and Bethune, Hamilton, and Philip, Cahon, and Menzies.

No. 6. Field Ambulance, C.E.F., which has been recruited from the fourth military division, is now in barracks at Montreal, preparatory to accompanying the second contingent. The officers are: Majors Phillip Burnett, and T. J. Murphy, P.A.M.C., Captain W. Howell, Lieutenants Andrew Macphail, R. H. M. Hardisty, G. Ross, H. P. Wright, and Walter. It is expected that Major R. P. Campbell, who is at present with the general hospital at Salisbury, will take command of this unit on its arrival in England.

Canadian Literature

Original Contributions

The Canadian Journal of Medicine and Surgery, December, 1914:

A fatal case of rabies in a child . . . J. G. Fitzgerald.

The Western Medical News, December, 1914:

Infant feeding . . . . J. W. Turnbull.

The Public Health Journal, December, 1914:

The use of the fermentation test in milk examination . . . . . . J. Race.

Medical inspection of schools in Edmonton	T. H. Whitelaw.
How can the average old stable be most cheaply fitted for the production of clean milk	J. B. Hollingsworth.
Nerve block, public health and tuberculosis	Sir J. Grant.
Principles of criminal anthropology . .	A. McDonald.
Light and ventilation as factors in public health	T. Watson.

La Clinique, December, 1914:

Traitement du cancer de la prostate .	F. de Martigny.

Medical Societies

CANADIAN MEDICAL ASSOCIATION

Vancouver Meeting, 1915

The annual meeting of the Canadian Medical Association for 1915, is to be held in Vancouver on July 6th, 7th, 8th and 9th, with Dr. R. E. McKechnie as president-elect. This western fixture coincides very happily with the Panama Pacific Exposition and also with the meeting of the American Medical Association in San Francisco in June 21st, 22nd, 23rd, 24th, 25th.

Arrangements are being made with the transportation companies for special rates for our members to include the San Francisco Exposition, so that pleasure and profitable entertainment can in this way be included in a trip to the West.

To those who have not been in British Columbia before, the Rocky Mountain trip is in itself worth all the cost, while in addition will be included the beautiful coast scenery, and the delightful summer weather, for which Vancouver is so justly famed. The phœnix-like growth of San Francisco will come as a marvellous surprise to those who knew this lovely city before the fire, and who mourned its loss, and who imagined that even the indomitable Western spirit could never attempt to rebuild on the old site. This same Western spirit, Canadian this time and not American, is rising now to make the Vancouver meeting a record one. Undaunted by bad times and war times, the medical fraternity in Vancouver are working hard, getting things in shape for the coming meeting, and can promise in advance, that none will find it a waste of time to go so far.

Apropos of war, a special feature of the programme will be the subject of military surgery, and while the Canadian military surgeons will be for the most part on active service, it is hoped that some of our American neighbours and *confreres* will give us some experiences in this line, which will be useful to those who are only waiting for their chance to serve their country.

The various sectional committees are in able hands and already many promises of papers have been obtained, but as yet it is too early to present a provisional programme. This will be given shortly, and in the meantime everyone should make up his mind to attend, to work towards that end and to remember that no meeting can be a success without outside attendance.

The committees would deem it a favour if those who are coming and are willing to present papers would notify the local secretary, Dr. Frederic Brodie, Birk's Building, Vancouver.

The Committee of Arrangements consists of the following doctors:

Chairman: W. D. Brydone-Jack.
Secretary: Dr. Frederic Brodie.
Executive: R. E. McKechnie, I. Glen Campbell, W. F. Coy, J. M. Pearson, Wm. C. McKechnie.

Together with the following sub-committees, the first name in each case being that of the chairman, and the second that of the secretary, of the respective sub-committees:

Finance: P. A. McLennan, A. S. Monro.
Reception: O. Weld, W. D. Keith.
Transportation and Publicity: A. P. Proctor, A. B. Gordon.
Accommodation: F. P. Patterson, J. A. MacDonald.
Exhibits: M. T. McEachern, G. H. Worthington.
Entertainment: E. D. Carder, T. R. B. Nelles.
Credentials and Registration: J. M. Pearson, G. H. Clement.
Medicine: J. W. McIntosh, A. R. Robertson.
Surgery: A. S. Monro, H. W. Riggs.
Obstetrics and Gynecology: W. B. Burnett, C. F. Covernton.
Eye, Ear, Nose and Throat: I. Glen Campbell, J. C. Farish.
Public Health: C. S. McKee, A. Cumming.
X-rays: H. H. McIntosh, G. E. Richards.

Military Surgery: F. C. McTavish, Stanley Paulin.
Pediatrics and Orthopedics: W. S. Verrall, W. A. Clarke.
Printing: J. H. McDermott, W. F. Mackay.

ONTARIO MEDICAL ASSOCIATION

It has been decided that the meeting of the Ontario Medical Association will be held in Peterboro on May 25th, 26th, 27th and 28th next, and that the Provincial Health Officers' Association, under the presidency of Dr. Hall, of Chatham, will hold its meeting in Peterboro also during the same week. The joint meetings of the two Associations will secure a very large attendance of the profession throughout the province, and will probably result in single fares being obtained for the delegates.

The accommodation for these meetings will be unusually good, as the Committee of Arrangements has succeeded in obtaining the use of several large halls, as well as of the Armouries, all of which lie side by side, and are but a short distance from the hotels.

The Committee on Papers and Business, under the direction of Drs. H. J. Hamilton of Toronto, and G. S. Cameron of Peterboro, has already had several meetings, and the programme is in an advanced state. It is expected that about ten papers will be read in each of the main sections, and the names of readers already secured ensure a programme of great interest.

On the evening of the first day there will be a public welcome, given by the City of Peterboro, and a public address on some health topic will follow. The President's address will be delivered the evening of the second day.

Members of the Associations desiring to read papers should communicate at once with Dr. Mann of Peterboro, or Dr. Strathy of Toronto, forwarding the titles of the papers which they desire to read. The committee has decided that no papers will be presented unless an abstract thereof be placed in the hands of the committee before the first of March.

At the meeting of the committee to arrange the programme of the section of medicine for the meeting of the Ontario Medical Association it was decided,

1. That the first meeting of the section take the form of a symposium, the subject being Diseases of the Heart.

2. That at each of the other two meetings of the section five papers be read. Papers to be read by invitation. (Ten representative men have been asked to give papers.)

3. That any member having a paper that he wishes to present to the section may send the paper to the Committee for their approval. If accepted it will be added to the programme.

4. The subject of all papers must be in the Secretary's hands by January 1st and a synopsis of the paper by March 16th. If these rules are not complied with the paper will be dropped from the programme.

ACADEMY OF MEDICINE, TORONTO

PROCEEDINGS OF THE SECTION OF MEDICINE

For the regular meeting of the Section of Medicine a symposium on headaches associated with various diseases had been arranged by the programme committee. The headaches associated with deranged metabolism were dealt with by Dr. W. J. Wilson, while Dr. Colin Campbell had been chosen to speak on those due to diseases of the eye, Dr. Gilbert Royce on those due to diseases of the ear, nose and throat, and Dr. Julian Loudon on those due to diseases of the central nervous system. Dr. George W. Ross confined his remarks to the special subjects of hemicrania, tic-douloureux and lymphorrhagia. In addition to this symposium, Dr. J. H. McPhedran presented a very interesting case of lymphatic leukæmia. The following is an extract of the remarks of these speakers and of the discussion which followed.

Lymphatic Leuaekmia: The case presented was a Macedonian, male, age nineteen, single, sausage maker. He was at the time an in-patient at St. Michael's Hospital to which he had been admitted on the recommendation of Dr. J. M. McCormack, on October 22nd, 1914. The history of the present illness was that he had not been feeling well for six weeks before admission. For one month before admission he had been suffering from thirst and loss of appetite. Two weeks before admission he began to be troubled with night sweats and immediately before that he had pain in the right hypochondrium and was unable to sleep. There was nothing of importance in the previous history, the family history, or the habits. He denied the possibility of venereal infection. On examination all the superficial lymphatic glands were found to be slightly enlarged and in many places were matted together. There was a large very hard mass in the right hypochondrium which extended from beneath the costal margin and reached to the middle line of the abdomen and to the level of the umbilicus. This mass moved slightly on respiration, and could be grasped between the hands when one hand was placed in the right loin and the other in the right hypochondrium or right side of the epigastric region. On looking at the chest an impulse could be seen in the fifth right interspace immediately inside the right nipple line. On percussion no cardiac dulness could be obtained on the left side, while an area corresponding to a transposed heart could be mapped out on the right side. The edge of what was evidently an enlarged and transposed liver could be felt beneath the costal margin of the left side. The conclusion was that the large hard mass in the right upper quadrant of the abdomen was an enlarged spleen. The *x*-ray plates showed the complete transposition of the viscera. To confirm this conclusion Dr. Loudon had been asked to take electrocardiograms,—the most positive signs we possess for diagnosing transposition of the heart. In the first lead from the two arms all the summits of the electrical waves were invested. This was so because the first lead was a symmetric one and the left arm of the abnormal subject stood in the same relation to the heart as the right arm in the normal subject. In the second lead from the right arm and left leg and in the third lead from the left arm and left leg, all the summits were the same as in the normal subject; but it should be remembered that the second lead corresponded to the third lead of the normal subject while the third lead corresponded to the second lead. Dr. McPhedran then proceeded to describe the blood picture. On October 24th, r.b.c. were 4,200,000 and w.b.c. 5,300. On October 26th, r.b.c. were 4,200,000, hæmoglobin 58 per cent. and w.b.c. 8,400. The differential white count showed polymorphonuclears 1 per cent., lymphocytes (almost all large) 97 per cent. and eosinophiles 2 per cent. On November 3rd, w.b.c. were 204,000. On November 4th, w.b.c. were 274,000 and r.b.c. 3,728,000. On November 8th, w.b.c. were 326,000 and on November 10th, 276,000. Just before the case was presented the w.b.c. were the same in number as on November 3rd. On October 28th, the Wassermann reaction was positive. The urine has been normal throughout. The temperature has been intermittent with an evening rise to 100° or 101°. On October 23rd, he was given potassium iodide three times a day. This was substituted by five minims of liquor arsenicalis three times a day on October 31st. On November 3rd, the liquor arsenicalis was discontinued, and ten minims of benzol three times a day was prescribed.

Headaches Due to Deranged Metabolism: Dr. W. J. Wilson spoke of headaches due to such conditions as anæmia, fevers, constipation, uræmia, and other toxic conditions. He stated that in a general way frontal headaches were dyspeptic, toxic, or malarial in origin. Occipital headaches were often due to constipation and caries of the lower molar teeth. Anæmic headaches affected the vertex and were due to neuralgia and caries of the upper teeth. If bilateral, the temporal headaches were likely to be found to have a toxic origin. The treatment of these classes of headaches was then reviewed.

HEADACHES DUE TO DISEASES OF THE EYE: In endeavoring to decide whether or not the headache was due to eye trouble Dr. Campbell said he attached a good deal of importance to the patient's story. He asked such questions as the following: "Is the vision good and comfortable?" "Is the distant vision good?" "Is the near vision good?" "How long have the headaches been troublesome?" "How often do the headaches occur?" One must be careful in elderly people not to mistake the temporal pain and vomiting of glaucoma for migraine. Pain due to efforts of accommodation or astigmatism was usually frontal or at the back of the eyes or through the temples. Anomalies of the ocular muscles were prone to cause pain in the occiput or down the spine. In speaking of refraction, Dr. Campbell said that it was impossible to determine the refraction of a child without the use of a mydriatic. The same may be said of all neuropathic patients under the age of twenty-five.

HEADACHES DUE TO DISEASES OF THE EAR, NOSE, AND THROAT: Dr. Gilbert Royce said that headache was perhaps the commonest symptom associated with diseases of the ear, nose and throat. Yet it was most elusive and was the least understood of all signs pointing to trouble in these regions. He emphasized the importance of the general practitioner being able to make a careful and thorough examination of these regions, so that he might recognise any abnormalities. Headache in these regions was mostly due to involvement of the branches of the fifth cranial nerve which supplies the mucous membrane in the various passages and sinuses. As a diagnostic symptom in connexion with nasal or sinus trouble, head pains were chiefly of value when taken along with other symptoms. Numerous diseases were then mentioned in more detail and the appropriate methods of treatment were described.

HEADACHES DUE TO DISEASES OF THE CENTRAL NERVOUS SYSTEM: Dr. Julian Loudon said that if headaches due to particular disease always exhibited the same characters and were always located in the same regions, we would possess in them one of the most invaluable symptoms from a diagnostic point of view. Unfortunately, there was nothing in the character or location of the headaches which surely distinguished the underlying disease. In consequence it was necessary to look for other signs and symptoms before one could feel sure of the diagnosis. Dr. Loudon then outlined a plan for the systematic examination of patients suffering from headaches. In regard to the causes of headaches, it was stated that all the causes acted by irritating the sensory nerves of the meninges or structures external to these. The brain itself was insensitive and extensive disease in it might exist without any pain, except the physical pain of mental misery. The commonest headache was said to be the neurasthenic type. This was constrictive, pressing or squeezing. It was worst in the morning and might have disappeared at night. The hysterical type was commonly vertical and was usually sharp and boring. The next class mentioned was the form due to tertiary syphilis. This was an early, common and almost constant symptom. It was worse at night and often very severe. In those cases in which it was due to arterial disease, it was important to remember that it might be a premonitory symptom of cerebral thrombosis. The headache of cerebral meningitis was a very significant and almost constant symptom, and was due to meningeal inflammation as well as to a general rise in intracranial pressure. The headaches due to cerebral tumours usually came on early and were due to a general rise in intracranial pressure. They often had great exacerbations which occurred either at night or in the daytime. Cerebral abscesses caused the same type of headache and were often not accompanied by a rise of temperature. The treatment was then outlined and several cases were quoted.

HEMICRANIA, TIC-DOLOUREUX, AND LYMPHORRHAGIA: Dr. George W. Ross briefly outlined the supposed causes of hemicrania, tic-doloureux, and lymphorrhagia. He defined lymphorrhagia as a blood state where the lymph escaped too readily into the surrounding tissues and caused a flooding of the lymph channels with fluid. Water-logging of the tissues ensued and with it a number of symptoms and signs. In regard to treatment of these conditions Dr. Ross stated that the majority of patients suffering from tic-doloureux could be quickly and easily relieved by intraneural injections of alcohol. When it was necessary to inject the larger branches of the fifth nerve the procedure should be left to one who had a special knowledge of the necessary technique. The method used, the results obtained, and the chemical action of the alcohol were then explained. In hemicrania, a case recalled where calcium therapy seemed to have helped. In another case complete relief was obtained after appendicectomy. It seemed possible that a chronic focus of infection might be found to play a part in the causation of this disease. In some cases Dr. Ross had controlled the attacks by injecting 1·5 cc. of novocain into the focus of the pain. In lymphorrhagia, all substances which lowered the coagulability of the blood were forbidden. Cow's milk was beneficial on account of the lime contained in it. Calcium lactate was administered three times a day for several weeks.

DISCUSSION: Dr. Paul Scott thought that the refraction should always be tested in cases of persistent headache. If headache were a recent development in a patient over fifty years of age, it was not usually due to errors in refraction. In some cases there might be several causes, and, while it might be found that the correction of the error of refraction might somewhat relieve the headache, it might also be found that it had not brought about a complete cure.

Dr. G. Sterling Ryerson concurred in Dr. Scott's remarks, and stated that a common cause of headaches not mentioned was a very small degree of myopic astigmatism.

Dr. Donald McGillivray asked why Dr. Ross prescribed caffeine with coal tar products for headache, and also if calcium lactate were not of less use than was often supposed.

Dr. Graham Chambers spoke of subjective headaches and said that cases which once suffered from nervous states might recall these states without apparent reason. He had seen and heard of cases in which the headache could not be explained on any other basis. He also stated that he had tried calcium lactate in so-called cases of lymphorrhagia without benefit and did not believe that the calcium salts necessarily increased the coagulability of the blood. He said it was rare to get other symptoms of this disease, such as chilblains and urticaria, accompanied by headache.

Dr. R. A. Reeve said he had noticed a gratifying change of attitude in general practitioners in regard to headaches. Patients then had more confidence in the family physician. Some were still suspicious of specialists as faddists. He was gratified to see the increased attention being paid to diseases of the eye, and said that everyone should be able to detect hypermetropia and correct it. All that was required were a few convex and weak cylindrical lenses. If there should be nominal visual acuity with a convex glass, the patient must have hypermetropia, as the normal eye cannot see so well with convex glasses as without them.

Dr. H. B. Anderson said that he had been much interested in the papers, but that they covered such a wide field that it was impossible to discuss them fully in one evening. One headache of which Dr. Wilson had spoken was the anæmic type. Dr. Loudon had mentioned a similar type with a sense of constriction, worse in the morning and often associated with neurasthenic symptoms. Dr. Ross mentioned a type worse in the morning which he called lymphorrhagia. Dr. Anderson thought that all these types were likely the same and that they were neurasthenic. The neurasthenic type was the commonest type of all headaches, and the anæmia which so frequently accompanied the headaches was another symptom of neurasthenia. He said that he had tried calcium lactate in what looked like suitable cases, but had not much success. He suggested that he had not used the drug with such a degree of assurance as Dr. Ross, and therefore had not produced such a good mental effect. In regard to migraine, Dr. Anderson thought that the most important part of the treatment was that carried out in the interval between the attacks. One must try to find an underlying cause. There may often be an autointoxication. It may be necessary to treat the digestion and regulate the bowels. Tonic treatment and the correction of errors of refraction may be indicated.

Dr. Trebilcock thought that pressure in the upper air passages such as the frontal sinuses was an extremely common cause of headache. He also said that there was a large series of cases in which the headache was said to be due to errors of refraction when it was in reality due to late hours and irregular meals. An example of this class were the young women stenographers, who were often led to believe thay were suffering from errors of refraction when such was not the case.

Dr. Ross, in replying to the discussion of his paper, said that it was necessary to keep a level head when considering new ideas such as lymphorrhagia. He would be delighted to admit that he was wrong in regard to lymphorrhagia, if a series of experiments, similar to those carried out by himself, showed that he had misinterpreted the results. In the treatment of this condition he said that the administration of calcium lactate was of no use unless a suitable diet was prescribed.

The meeting then adjourned.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The seventeenth regular meeting of the Society was held Friday evening, June 5th, 1914, Dr. D. F. Gurd, president, in the chair.

Pathological Specimens: Series by Dr. L. J. Rhea.

1. Peyer's patches from a case of typhoid fever, early stage.

2. Mesenteric lymph nodes from same case, with suppuration; pure cultures of typhoid bacilli obtained.

3. Kidneys and ureters showing tuberculosis, one kidney shows an old lesion, the other a recent one.

4. Horse-shoe kidney.

Case Reports: 1. Failure to close abdominal wall, by Drs. K. Cameron and L. J. Rhea.

Dr. Cameron: The baby was born at eight months, the whole of the intestinal tract was outside the body through an opening about two inches to the right of the umbilicus. I opened up the whole extent of the abdominal wall and made an effort to get this intestinal tract within the wall but failed to do so; there was no attachment of the viscera to the spinal column. Dr. Rhea reports that there is no congenital malformation of the intestinal tract beyond the fact that it was swollen, though it seemed to me that the small intestine was much smaller than usual; it was patent.

Dr. Rhea: I believe these defects are explained upon embryological bases; the cleavage line in front either is not closed or it is very thin and ruptures.

Discussion: Dr. Bazin: It seems to me this is simply a worse condition than the one Dr. Powell reported at the last meeting. I should like to ask Dr. Cameron if the defect were present only in the abdominal wall or if it extended into the thorax. There is a longitudinal fissure in the sternum which sometimes persists and that may extend through to the surface, and not only may one get protrusion of the abdominal contents but also of the thoracic. These cases never develop with the intestines outside the body; it is the bursting of the membrana reuniens, either just prior to birth or at the time of birth, that delivers the abdominal organs just outside the cavity.

Dr. Cameron: The only defect present was the opening in the abdominal wall:

2. Note on the thyro-glossal duct, by Drs. G. Ross and T. A. Malloch. Patient developed a rapidly growing swelling about 4 cm. above the supraclavicular notch with pain and stiffness in the neck. At first firm, the size of a cherry, then soft and fluctuating. There was a small opening about the size of a pin-head on the surface of the mass which patient said had always been there. Incised by Dr. Garrow.

Discussion: Dr. L. J. Rhea: One case I saw was in a little girl of six years; the cord-like character was very evident. It was very hard like an arterio-sclerotic vessel, and I was unable to demonstrate the type of epithelium on account of the fact that it was infected.

Dr. Guy Johnson: I would like to ask if this mass moved up and down on swallowing, as I have seen four or five of these and in every case the cyst was seen moving up and down on swallowing.

Dr. G. Ross: It was noted that the mass moved up and down on swallowing.

3. Hour-glass stomach, illustrated by skiagrams, Dr. A. Bazin and Dr. L. J. Rhea.

We wish to bring to your attention to-night two cases of hour-glass stomach, the study of which will, I think, well repay the time spent. These cases illustrate two distinct types in regard to (a) symptoms, (b) operative findings, and (c) operative treatment.

Case 1. In February, 1909, A. H., female, aged thirty-seven, married, nulliparous, complained that for a year previous had severe continuous indigestion characterised by poor appetite, flatulence, and weighty feeling after meals; no pain but great distress relieved by vomiting. Vomiting usually constant after every meal; occasionally a meal or two retained but later a much larger quantity vomited (gastrectasis). Vomitus consists of ingested food, much fermented, no blood. Emaciation is extreme, weight from 153 to 105 lbs. Had always had "indigestion"; at age of fourteen had pain after eating and a "tender sore stomach". "Peritonitis" at eleven, cause unknown. Menstrual distress, irregularity, periods of amenorrhœa frequent varying from a few months to nineteen months. Hæmorrhoids removed in 1905.

Examination: Epigastric distension, more marked to left of mid line, visible peristalsis from left to right, very sluggish. Amphoric note of stomach has seven inches vertical diameter extending two inch below umbilicus and right border of amphoric note is vertical and broad, not narrowing off to the pyloric region. Vomiting caused epigastric distension to disappear. Both kidneys freely movable, the right down to pelvic brim (true), the left allows of upper pole to be grasped. The hypogastrium is prominent and inflated colon shows that it occupies this portion of the abdomen. Test meal gives large quantity, total acidity 70, no HCl, lactic acid plus, no rennet or pepsin digestion, no blood. These findings pointed to an atonic dilatation of the stomach associated with a splanchnoptosis. Lavage was commenced and the patient easily learned to carry this out for herself. Occasionally during this period of treatment it was noticed that soiling of the wash water would occur in the manner indicative of hour-glass stomach but both general and local improvement was marked for a couple of months. Subsequently, however, there was relapse in spite of continued lavage. The test meal resulted in similiar findings, viz.: no HCl, no pepsin or rennet digestion; lactic acid, however, was absent.

Operation July 3rd, 1909: Small hard scar on lesser curvature, five inches from pylorus and encircling the stomach which was typically hour-glass in shape. The lumen of the constriction would not admit the tip of the little finger; the cardiac pouch was large and thick walled, the pyloric pouch large and thin walled. The opposing borders of the two pouches lay together and overlapped, thus explaining the inability to work out by percussion anything but the outline of a largely dilated stomach. The pyloric ring was attenuated and greatly distended, as was also the duodenum as far as the superior mesenteric vessels when the intestine suddenly became contracted.

This I regard as a form of chronic or slowly forming arteriomesentric ileus caused by the distended and heavily loaded cardiac pouch pressing downward upon the root of the mesentery and thus gradually tightening the superior mesenteric vessels across the third part of the duodenum with partial obstruction of the same. Without this explanation (obstruction) one would expect the cardiac pouch and duodenum, in fact all portions of the intestinal tract distal to the hour-glass constriction, to be empty and contracted. There were no glands to be seen or felt and no adhesions present. The original ulcer seemed to be quite healed and quiescent. A gastro-gastrostomy was done by a horseshoe incision (modified from Finney's gastro-duodenostomy), giving a lumen which easily admitted the whole hand. Convalescence was uneventful. In three months she weighed 143 lbs., eating heartily. There was some flatulence but no vomiting. September, 1910: Test meal shows free HCl, pepsin and rennet digestion; splanchnoptosis has disappeared; inflated stomach is above the level of the umbilicus. I saw her to-day, June 4th, 1914 (five years after operation); she has trained as a nurse and follows her profession without difficulty, eats heartily, no indigestion and weighs 155 lbs.

Case 2. M. C., female aged thirty-one years, married, nulliparous. Admitted to Montreal General Hospital April 23rd, 1914, referred by Dr. F. Tees. Complaints: acute stomach distress with pain and vomiting for two weeks, hæmatemesis preceding day. Since age of fourteen has suffered from attacks of pain and vomiting with intervals of health; has been treated for gastric ulcer.

Examination: Fairly well nourished; tongue thickly furred, breath foul. Abdomen normal in contour, diffuse tenderness over upper abdomen and right inguinal region; complains of pain upon turning in bed; no occult blood in stool. Put on Leuhartz diet with enema of saline with glucose five per cent. Stomach very irritable, vomits frequently, nausea constant requiring discontinuance of Leuhartz for a few days. Gradual improvement and barium meal with *x*-ray done May 6th. This showed an hour-glass condition and operation was performed May 15th.

Five inches from pylorus along lesser curvature was situated a mass of indurated stomach wall and gastro-hepatic omentum, very firm and hard, nodular, and bound down posteriorly. A chain of large soft glands extended along the whole length of the lesser curvature and was continuous with similiar glands in the gastro-hepatic omentum up to the hilus of the liver. The foramen of Winslow was patent but the lesser sac was divided into an upper and lower portion by adhesions running transversely and binding the lesser curvature to the posterior wall of the lesser sac. The greater curvature, opposite the ulcer was indented and drawn by the cicatrix up toward the lesser curvature; the lumen of the constriction would admit two fingers. The stomach was isolated from above and below, clamps applied, and the portion of stomach bearing the ulcer removed. The portion excised was two and a half inches along the lesser curvature and two inches along the greater curvature. The ends were united leaving a lumen capable of admitting all the fingers of one hand. Recovery was uneventful, drink and diet were allowed as controlled by the patient's appetite and she was discharged on May 28th.

Conclusion: Case 1 is illustrative of the text-book type of hour-glass stomach in which the symptoms are definitely obstructive and are due to the effects of a chronic ulcerative process with scar formation and contraction. Case 2 shows an earlier stage, one might term it "the formative period of an hour-glass contraction." The symptoms are those of an irritable stomach caused by an active ulcer. It also demonstrates (as shown by the radiograph taken immediately after ingestion of the Barium meal) that an ulcer occupying a small area is capable of setting up tonic contraction in the stomach wall producing spasmodic stricture or "spasmodic hour glass stomach." The importance of *x*-ray examination of stomach conditions cannot be too strongly urged. In our opinion it ranks ahead of history and all other methods of clinical investigation.

4. Gastric ulcer with carcinoma, Dr. A. T. Bazin.

A. F., male, aged sixty-seven, admitted to Montreal General Hospital May 12th, 1914, referred by Dr. Robert Elder of Granby. Complaints: gastric distress, vomiting and emaciation. For twelve years has had "stomach trouble" characterized by burning in epigastrium, sour eructations and flatulence coming on one to two hours after meals, relieved by taking food or drink. For one year has had vomiting with more severe pain and an emaciation of 25 lbs. No hæmatemesis or melæna.

Examination reveals definite mass in epigastrium. Test meal shows food retention; free HCl present, acid content not determined as the meal met with an accident during the examination, no occult blood. Stool shows occult blood. Barium *x*-ray shows retention after six hours and ill defined duodenum and pyloric region. Diagnosis of duodenal ulcer was made.

Operation May 18th: Considerable amount of clear serous fluid in abdomen. Pyloric region occupied by a hard nodular mass firmly bound down to the head of the pancreas; pyloric ring was cirrhotic and stenosed. Along the lower border of the mass were a few enlarged lymphatic glands very hard and shotty. No glands palpable or visible along lesser curvature. The condition was undoubtedly a duodenal ulcer but with the shotty lymph glands and the presence of fluid in peritoneal cavity, the suspicion was aroused that there might be malignant change taking place. Pylorectomy performed the mass having to be cut away from the pancreas, incision passing through dense cicatricial tissue. The ends were closed over and a posterior gastrojejunostomy done. The patient was up on the eighth day; discharged on the fourteenth day, eating well, no distress, and gaining strength rapidly. Pathological report showed carcinomatous condition present.

Discussion: Dr. J. M. Elder: I have had several cases of hour-glass stomach and I find that the treatment is to be varied with the condition one finds. Sometimes one may do a Heineke-Mikulicz gastroplasty and sometimes incise the whole lesion and do an end to end gastro-anastomosis. Again one may have to do a side-to-side anastomosis because you cannot sufficiently free the stomach posteriorly to do it otherwise. In all my cases of hour-glass stomach, except one, the deformity was due to ulceration. In that case the stomach was picked up by a ligamentous band of the right rectus muscle. I did not interfere with the hour glass but did a posterior-gastro-enterostomy to the large pouch and the case went on very well. Before the days of bismuth meals and x-rays a diagnosis was very difficult, though with air inflation one can often make out perfectly well the two halves of a distinctly hour-glass stomach. With regard to the case of duodenal ulcer an interesting question has been raised. I have always felt that these ulcers are common, much more than the gastric ulcer. Mayo says when you are operating for gastric ulcer, always go the right of the median line because most of these are duodenal. The question as to what is the relationship between duodenal ulcer and carcinoma is one which arouses a very great deal of interest to-day. Moynihan does not believe that duodenal ulcer has much to do with the cancerous condition, but thinks that where you have carcinoma it has likely been carcinoma originally. On the other hand the only thing we do know about the etiology of cancer is that it follows upon irritation and, given a chronic irritation of an ulcer, one is strongly tempted to believe that carcinoma would be likely to develop upon the site of a chronic ulcer, as we know it does elsewhere.

Dr. F. B. Gurd: Does the absence or presence of hydrochloric acid in the stomach in these ulcerative conditions hold any significance now as to the innocence of the growth?

Dr. J. M. Elder: I have records of thirty-five cases of stomach that I have operated upon and in all cases the same routine was followed, testing always for the presence or absence of HCl, and I do not think that one can attach the slightest importance to either its absence or presence as indicating a concerous condition or otherwise.

THE first regular meeting of the society was held Friday evening, October 2nd, 1914, Dr. W. F. Hamilton, president, in the chair.

The retiring president's address was read, also a report from the secretary for the past session.

Dr. G. E. Armstrong gave an account of the meeting of the Congress of Surgeons and Dr. W Grant Stewart of the transactions of the British Medical Association. The meeting took the form of the usual annual smoker, the members providing their own materials as it was the wish of the society that the sum usually expended on this meeting be sent to the Red Cross Society.

It was also recommended that during the term of service of those members who had volunteered for active service, the society carry such members without payment of dues. The members of the society were also unanimous in offering their services free to the families of those who had gone to the front.

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THE ACUTE ABDOMEN

A Clinical Study

By J. M. Elder, B.A., M.D.

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I HAVE taken as the subject of my address, "The Acute Abdomen," as I consider it a subject of interest to all. Surgically speaking, in the vast majority of cases, this condition is either a local or a general inflammation of the large serous sac, the peritoneum. This inflammation, with its classical symptoms of *dolor*, *calor*, *rubor* and *tumor*, is in most instances due to sepsis, though I am sure I have seen several instances of what Treves calls "peritonism", where all the signs and symptoms of peritonitis are present, and yet upon opening the abdomen no sign of inflammation could be found. But leaving aside these occasional very puzzling anomalous cases, let us consider our subject from the clinical standpoint, as it is from that standpoint that it interests most of us in active practice.

1. What symptoms are sufficient to make us decide that we have to deal with some acute abdominal condition?

In order to arrive at anything like correct conclusions one must not rely upon any one symptom; it is upon the whole picture presented to us clinically—the "symptom-complex" as we'll call it—that we must base our diagnosis of an acute abdomen. And once we have got there our investigations have but begun. We must then proceed, by elimination, to fix upon the specific cause of the trouble, in the case we are examining. No easy task, I grant you,

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An address delivered by invitation to the Saskatchewan Medical Association at the annual meeting held in Saskatoon, August 18th, 1914.

but one which, if methodically persevered in with regard to every case we examine, will, as our experience grows, gradually diminish the number of "exploratory laparotomies," which is only a euphemism for "not knowing what is wrong, let us look in and see." We have all done it and we have all been sorry at times for the results of that look.

Symptoms of Acute Abdomen: 1. Pain (*dolor*). Sometimes sudden in onset, sometimes gradual, sometimes pointing to the seat of disease, but more often *not.* Pain is often referred and the trouble may not be in the abdomen at all. How often, especially in children, have we been called in to operate upon an acute appendix and found that the trouble was pneumonia in the lower lobe of the right lung? How often does right-sided abdominal pain and rigidity indicate, not appendix trouble, but stone in the right ureter or bile ducts, or a Dietl's crisis due to floating right kidney? But pain is a subjective symptom; what about its objective synonym, *tenderness?* Here we are clinically upon a little firmer ground. We may, by palpation, locate the situation of the pain. Personally, in these cases, I lay considerable stress upon the presence or absence of "rebound pain."

2. Rigidity is the splinting of the muscles, generally involuntary, to protect the diseased organ. But these muscles can only act from their attachments, and a splinted muscle may cover up both gall-bladder and appendix, for example, and leave us still in doubt. But *increasing* rigidity in any quadrant of the abdomen is a pretty good indication that the trouble is located in that quadrant.

3. Vomiting is not a very reliable sign of acute peritonitis. It is associated with so many other conditions that it is often apt to lead us astray here.

4. Increased temperature (*calor*). As head of a large surgical clinic, I often say that I wish, in so far as acute abdominal conditions are concerned, that there were no thermometers. This may sound heretical, but let me explain what I mean and I am sure you will agree with me. How often do we see the abdominal cavity filled with pus and the patient moribund, and yet the temperature has never been above the normal? And just because the thermometer—that vest-pocket fetish which we all carry, indicated "set fair," we neglected to examine the patient thoroughly, and so let him drift on to destruction. Put not your trust in thermometers in these cases!

5. And the same remarks are true of the pulse rate, only in a lesser degree. The pulse is a far more reliable guide than the tem-

perature, and an increasing pulse rate in these cases should make us examine thoroughly and repeatedly.

Is there an "abdominal facies"—that drawn, pinched, anxious look upon which, as students, we were taught to look with diagnostic eye? There is, when not masked by an opiate; but if you wait for it you have waited much too long.

What, then, is the symptom-complex which would enable us to diagnose an acute abdomen and set us at once to work to find out the definite cause of the trouble? Pain, rigidity and tenderness, certainly; nausea or vomiting, perhaps; with increase of pulse rate and perhaps fever, are our cardinal symptoms. Associated with these there may be a rigor, and when present it is a very valuable sign. Not only will the abdominal muscles be splinted, but peristalsis will be inhibited, and therefore constipation and distension will be present in most cases.

Given, then, such a condition, let us proceed to examine the case; and here we must have some method and adhere to it in all cases, if we are to avoid the pit-fall of the "snap diagnosis." (*a*) Inspection: see if any distension is present; if the abdomen moves symmetrically with respiration, or if there be present immobility of any particular area. (*b*) Percussion: see if any undue dull areas or the reverse; also whether the dulness is movable, indicating free fluid, and whether increasing or diminishing. (*c*) Palpation: I know of no manœuvre needing more training or a finer touch than this, if it is to yield us the information we desire. Lay the hand flat and firmly on the abdomen and palpate with the tips of the fingers only. Do not punch the tips of the fingers into a tender abdomen; you get a *general*, not a *local*, protest from such an insult, and it is the local protest you are looking for. Begin by examining first the regions which are not tender or rigid, gaining thereby the patient's confidence. Here, too, you try for that valuable symptom, "rebound pain." Next examine carefully the regions complained of.

Having thus arrived at our general diagnosis of an acute abdomen we will next proceed to determine, if possible, the cause of the condition. 1. Was there traumatism, and as a result a possible rupture of some hollow or solid abdominal viscus? Is it a case of intra-abdominal hæmorrhage? The board-like rigidity of the whole abdomen, the movable dulness in the dependent parts (e.g., the flanks), and the symptoms of shock (always provided morphia has not been given), and the increased pulse rate, will generally lead us right here. A very little time accentuates all these symptoms and calls for speedy interference on our part.

2. Is the condition due to pathological rupture of some viscus, e.g., some part of the gastro-intestinal tract, as in perforating gastric or duodenal ulcer, rupture of bowel, perforating typhoid ulcer, or perforated appendix or gall-bladder? Here *pain* is the predominating symptom. At onset it is acute, even agonizing, shock is present, and examination shows tympanitic areas at the upper parts of the abdomen, with dull areas gradually developing in the dependent parts. The rigidity is not so board-like as in hæmorrhage, and the shock passes off much more quickly.

3. Is the condition due to some interference with the blood supply to a viscus, with or without intestinal obstruction, as a concomitant condition?

Here one must endeavour to exclude all such conditions as strangulated hernias (easy if external, but not so easy if internal, or even obturator, of which I have reported three cases). Volvulus, intussusception, strangulation of a loop of bowel by a band of adhesions, are other conditions which fall into this class. Let us pause for a moment to see how clinical experience may help us to differentiate here.

In a strangulated *hernia* there are usually symptoms of intestinal obstruction; but this may not be complete, and then we would suspect a Littré's hernia (of Meckel's diverticulum), or a Richter's hernia. Never neglect a rectal examination if obstruction is showing. *Volvulus* is commonly found in old people the subjects of constipation with lax abdominal walls, and at the site of the sigmoid flexure. *Intussusception* is, *per contra*, the characteristic obstruction of infants. In both cases the relaxation of the abdominal wall by an anæsthetic will gradually enable one to palpate the mass, and no diagnosis is complete without this. *Adhesions* would be suspected in a case that had been previously operated upon, or that had been the subject of previous attacks of peritonitis. In many cases I freely admit that no accurate diagnosis is possible, and here an exploratory laparotomy is all that is left for us. But let it, in turn, be done methodically. Open the abdomen below the umbilicus, seize the ileo-cæcal valve, and if that is collapsed, follow up the small intestine to the point of strangulation; if, on the contrary, it is dilated, then you know the trouble is in the large bowel. Next examine the sigmoid; if that is collapsed, you have the trouble between cæcum and sigmoid, and if the latter is dilated, then you have failed to make a thorough rectal examination.

4. Again, the condition may be infective from the outset, due to pathological changes in some intra-abdominal organ; and the most common are, appendix, pus-tubes, biliary passages, and pancreas.

Just as the old French savant's advice in the case of family troubles was "cherchez la femme," so in all cases of acute abdomen, without obvious cause, we are accustomed to suspect the appendix. In the great majority of cases we will be right; but never take it for granted. I take it that you are all familiar with the methods of examining the appendix. Just in one class of cases is there danger of failing, and that is in young children. Here you must remember that the appendix is generally a pelvic organ and so may get into a very bad condition, filling the whole pelvis with pus, and yet no sign will be present in the abdomen proper. I consider no examination of a child's abdomen, where appendicitis is suspected, is at all adequate without digital examination of the rectum. It is not painful to the patient, and you will often be rewarded by coming upon the inflamed and tender appendix in the pelvis. The differentiation between appendix and gall-bladder is a very difficult matter, but the points of maximum tenderness differ and so do the areas of rigidity; and should a mass be present, it moves up and down with respiration in the case of the gall-bladder, not so in the case of the appendix. The appendix patient usually suffers more pain and is altogether a more sick person than the one whose trouble is in the gall-bladder. You may safely wait in a gall-bladder case: you can not do so in an appendix. Of course other symptoms, such as jaundice, may help you out, but their absence should not be relied upon to exclude anything. Pus tubes may usually be determined by a careful bimanual examination, either vaginal or rectal.

But a much more puzzling condition than either of these is presented by those cases of acute pancreatitis one meets with now and then—the so-called apoplexy of the pancreas. I well remember the first case of the kind I ever saw. She was a ward-maid in the hospital, and while scrubbing the floors, was seized with agonizing abdominal pains, great shock, and rapidly oncoming abdominal distension. Beyond recurrent attacks of rather severe indigestion and vomiting she had not been ill. I suspected perforated gastric or duodenal ulcer and opened the abdomen. Alas! I could never get it closed again; all the distended coils of bowel were a dull blue colour and broke in my hands like wet blotting-paper; they would not hold any form of suture and the patient died on the table. Had I examined for glycosuria, as I have since learned to do, I could have diagnosed the condition and avoided a harmful operation, for I have since seen two such patients recover without operation, where I am certain operative interference would have proved fatal. Don't fail, then, to test for sugar in the urine in all these cases.

How far does a leucocyte count aid in these cases of acute abdominal trouble? Leucocytosis does help in many cases, and should, if possible, be done, but its value is more prognostic than diagnostic. An increasing white cell count is an indication that the patient has a good chance of recovery if the source of trouble be removed. But it is, after all, rather a relative matter. A leucocyte count of 10,000 may be high for a typhoid patient, whereas it is but normal for an ordinary patient. But a sudden increase in the leucocytosis of a typhoid case, associated with abdominal pain and right-sided rigidity, would be a strong indication of perforating typhoid ulcer. An increasing leucocytosis in any acute abdominal condition should put us on our guard—there is mischief going on somewhere, the guards are ordered out for duty.

Operation: Here I must restrict myself to general principles only. I was much struck by the truth of one of John B. Murphy's bright remarks: "In operating upon an acute abdomen, get in as quickly as you can and get out just a little quicker." Avoid all undue traumatism to the epithelial lining of that serous sac. These epithelial cells will need all the vitality they have to recover from the septic shock, and any undue traumatism on your part may turn the scale against them. When I think of the harm we did by mopping, washing, and handling the infected coils of bowel in our operations some years ago, and of the ill—often fatal—effects which followed upon our well-meant efforts, it makes me very humble. "*Pas trop de zele*" should be our motto here. At my clinic we aspirate out the pus from the pelvis, having lowered the patient's feet. But in cases of perforated gastric or duodenal ulcer, I do a gastro-enterostomy, as well as sew up the opening, if the patient's condition will at all permit of it. But do you always remove the gangrenous appendix or gall-bladder, I hear someone asking? No. If we can do so without traumatism or undue prolongation of the operation, we do it; but never risk the patient to do a complete operation. Better a fæcal or biliary fistula, which can be treated by a subsequent operation, than a completed operation and a dead patient. And this brings me to say a word about drainage of the abdominal cavity.

When should we drain? It all depends upon the condition of the peritoneum. If it looks a good color, is glistening, remove the gross soiling and close up. If it is very red and of a dull colour you must drain, perferably using a Mikulicz vaginal drain in the female. But don't forget that any drain in the general cavity becomes blocked off in a few hours and collections of fluid may form around it and can't drain into it. But when in doubt I say don't drain. It is wonderful, if your after-treatment is efficient, how much filth the peritoneum will take care of. But that is a big "if," and I am quite convinced that more lives are lost in cases of acute abdominal infections from inefficient post-operative measures than from inefficient operations.

Will you allow me to state just here our routine post-operative treatment of a case of general peritonitis, with or without drainage. The operation is finished with the patient in the Fowler position, and without changing that position (except perhaps slightly to exaggerate it) the patient is so put in bed. We thus keep our septic material in the basement. Our next object is to dilute this, and this we do by saline proctoclysis (Murphy), or by repeated (every four hours) large enemas of warm normal saline solution. Next, to eliminate the poison, we depend upon nature's drain—the colon and rectum. Every four hours, alternating with the salines, the patient receives a soap-suds enema, to which is added one drachm of spirits of turpentine and twenty grains of quinine bisulphate. Nothing is given by mouth until the enemas are effectual and there is evidence of returning peristalsis, shown by passing flatus. Should the enemas prove ineffectual and abdominal distension, probably associated with vomiting, come on, we resort to the use of eserine, giving, hypodermically, one-sixtieth grain (combined with one-thirtieth of strychnine sulphate) every three hours for four doses. This in bad cases may be repeated the following day. But if the Fowler position has its great advantages, it always needs watching. Sometimes the vomiting comes on early and is explosive in character, like a case of high obstruction. And so it is. The Fowler position must then be changed to the reverse, or Trendelenberg, position, and the vomiting speedily stops. What has happened here? I have always noticed this accident to happen in fat persons, with a fat omentum, and my own theory is that this heavy and infected, omentum drags down upon the colon and stomach, when the patient is kept sitting up, sufficiently to produce an obstructive kink at the duodeno-jejunal fold. Reverse the position and the kink disappears, and so do the symptoms of high obstruction.

These patients, like cases of gastro-enterostomy, should be put on liquid and nourishing diet as soon as they can retain it.

What do we do for a failing pulse during all this time? Camphor (one grain in ten minims of olive oil) is rapid but evanescent; strychnia I regard as useless. To meet this condition we pin our faith largely upon intravenous saline injections, combined with pituitary extract (one cc. to the pint of saline). This may be repeated in two hours if indicated. Pituitary extract, given thus, is far ahead of adrenalin given hypodermically, as its effects are more lasting.

I trust, *confreres*, that in this rather hurried sketch, I have given you a fair likeness of the acute abdomen, how to recognise it, and how to treat it, and though I am well aware it is only a sketch, one could not hope, in the course of an address such as this, to do more than touch upon the main points at issue, trying always to avoid theory and to stick to the clinical findings which so far have given us the best results.

THE following is the list of Canadians who were elected Fellows of the American College of Surgeons at the recent convocation in Washington:

Alberta: Robert George Brett, Banff; L. Stewart McKidd, Calgary.

British Columbia: William H. K. Anderson, Fernie; Frank William Green, Cranbrook; Edward Charles Hart, Victoria; William John Knox, Kelowna; Henry R. Storrs, Vancouver.

Manitoba: Robert D. Fletcher, Winnipeg.

New Brunswick: George Arthur Addy, St. Johns.

Newfoundland : John Masson Little, St. Anthony.

Ontario : Adam T. Shillington, Ottawa; John F. Uren, Toronto; George S. Ryerson, Toronto; Walter P. McKeown, Toronto.

Prince Edward Island: Stephen R. Jenkins, Charlottetown.

Quebec: Robert H. Craig, Montreal; Walter H. P. Hill, Montreal; George W. L. Hume, Sherbrooke.

Saskatchewan: Andrew Croll, Saskatoon; George R. Peterson, Saskatoon.

THE DIAGNOSIS AND TREATMENT OF GASTRIC AND DUODENAL ULCERS

By Max Einhorn, M.D.

Professor of Medicine at the New York Postgraduate Medical School.

THE diagnosis of peptic ulcer is made if we have a distinct hæmorrhage from the stomach, which manifests itself by the vomiting of blood or the passing of blood with the stools, and by pains in the gastric region. These are the cardinal symptoms. If, however, the diagnosis of gastric or duodenal ulcer is restricted to only these symptoms, we would fail to recognize a great many cases of ulcer in which these two symptoms have not been noted. We know that we often fail to make the diagnosis of stomach ulcer, because it is found in autopsies that about four per cent. of all who die have ulcers in the digestive tract!—stomach or duodenum. If we were to restrict the diagnosis to these symptoms, therefore, we would find it in one per cent., or less. That is the way we know we do not make the diagnosis frequently enough.

Boas has discovered the fact that there are cases of ulcer in which there is no manifest hæmorrhage, but in which the blood becomes recognizable in the gastric contents or in the stools by employing chemical tests; and we call that occult blood. It is not recognizable macroscopically, but we can find that it is there. So he introduced a method of looking for occult blood in the gastric contents or stools, as a help to recognizing this condition. This marked a great advance in the diagnosis of ulcers.

Now if there is an ulcer in the digestive tract at the cardia, or pylorus, or elsewhere, then at times when there is more activity in the ulcerative process the blood comes out. In a quiescent state there is not enough blood to lead to its discovery in the stools or gastric contents. The ulcer may be there, but you will find no blood, even by these chemical tests, and the reason for that is that the contents of the intestinal tract are considerable, and the blood is mixed up with a great deal of food and water, and part of it is absorbed and digested, so that there is very little left to appear.

Address delivered at the meeting of the Canadian Medical Association at St. John, N.B., on July 8th, 1914.

The consequence is that we can recognize even the occult blood only when there is a considerable amount of it. We have ulcers in the quiescent stage, but we cannot find blood in the gastric contents or stools.

Now we have another test, that is the thread test. Here we have a method by which, even when there is no exacerbation of the process, no direct oozing of blood, we can in some instances recognize it anyway. The principle of it is that a thread with a tiny bucket attached is left in the digestive tract for quite a period of time—say given in the evening and left in until eight o'clock in the morning. As soon as the bucket gets into the duodenum it will proceed as far as the length of the fastened thread will permit, but remains there, and stretches the thread. If the bucket has remained in the duodenum for two, four, six hours, it has come into direct contact with the walls of the stomach, and if the ulcer is situated at the cardia (lesser curvature), or the pylorus, for instance, the thread has become impregnated with the ulcer surface, which is always moist, and we get a mark on the thread corresponding to the situation of the ulcer. This not only shows the presence of the ulcer, but often the location, for by estimating the distance from the lips to the cardia or the pylorus, it is easy to arrive at a fair idea of the position of the ulcer. This test makes it quite possible to recognize ulcers in patients who have no hæmorrhages yet, and when there is not yet a distinct oozing of blood, no blood in the gastric contents and none in the stools. It is characteristic for the stain to be quite localized. If you get a sharp stain in a definite spot, it is of more value than a stain that is much spread out. That the stain is not caused by an artificial erosion produced by the pulling of the thread, can be shown by the following circumstance. It is not exactly red, but dark brownish; it is not fresh. If you got a stain due to the erosion of the pulling thread, it would be a fresh stain of red blood, and it would be more spread out.

How shall we differentiate between gastric and duodenal ulcers? Years ago it was thought that the differentiation between these two kinds of ulcers was almost impossible. Within recent years the opinion prevails that it is a very easy thing to do; and this is the opinion of Moynihan. In fact, Moynihan says that one needs no tests at all in order to recognize a duodenal ulcer, but that it can be done by the history of the case in association with the clinical symptoms, *i.e.*, pain two or three hours after meals; still later, hunger pain, that is, pain allayed by the ingestion of food; the periodic appearance of these symptoms, periods of suffering for two or three weeks, interchanging with feelings of euphoria (well-being); chronicity all these years. All these go, according to Moynihan, to make the diagnosis. He says that nothing else is necessary. If you have these, you have a duodenal ulcer.

My opinion is that these points alone cannot be taken for a positive proof of a duodenal ulcer. We may have the above symptom complex and there may be either a gastric ulcer present or perhaps none at all. The fact that such a symptom complex can be caused by gastric ulcer has been demonstrated by patients who have been operated upon. In these the symptoms sometimes were found to be due not to duodenal ulcers, but to ulcers in the stomach situated near the pylorus or along the lesser curvature, even near the cardia. Whether such a symptom complex exists without ulceration, I could not say, for I don't have these patients operated frequently. I could not give the proof, but from what I know I would say that in a great number of cases that have this symptom complex there are no ulcers. But what is of importance is that in these cases where there is so much acidity and discomfort, two, three, or four hours after meals, if that abdominal disturbance continues it will ultimately give rise to ulceration. The ulceration is not the primary factor; it is due to these functional disorders of gastric secretion. If you wait long enough you will have an ulcer.

Now there is one point more which I wish to speak of, that is, that the surgeons nowadays, Moynihan, too, claim that in the symptomatology of ulcer the pains do not appear right after eating, as was formerly supposed, but always two or three hours later. I think that that has been exaggerated, and I must say that the old teaching of our clinicians that ulcer of the stomach is indicated by pain pretty soon after eating is correct. I will explain that divergence of opinion. If there is an ulcer somewhere in the stomach and it is not in the quiescent state, but in an active state, we have pain pretty soon after eating, not late after, and we have pain on pressure. The pressure may not be great, and still there is pain. But if we have to deal with a latent, quiescent, not active, ulcer, at that time we may have no pain. We have a patient, for instance, who has too much acidity, pains two or three hours after meals. The pains are there, no matter whether the ulceration is there or not. In these cases where the great acidity gives rise to an ulcer, the other condition, hyperchlorhydria exists, but the symptoms are not due entirely to the ulceration, but to the primary troubles. The ulcer exaggerates the symptoms. If there is great acidity, it makes itself felt sooner. That is the explanation I would give.

An ulcer can, however, exist with a normal acidity and also with a diminished acidity, but in most of these patients there is too much acidity. I have made a chemical analysis before I knew there was an ulcer, and there was found to be an achylia gastrica. The patient had to undergo an operation for gallstones and a gastric ulcer was discovered at the laparotomy.

How shall we make a diagnosis of gastric or duodenal ulcer?

Formerly it was believed that if the pains appeared late after the meals, the probability was that the ulcer was in the duodenum. That was taken for a prominent sign twelve or fifteen years ago. Now, as I have told you, Moynihan lays still more stress on that. Another sign is that in gastric ulcer the blood is usually vomited, while in duodenal ulcer there is less vomiting but the blood appears in the stools—large hæmorrhages appearing in the movements and the patient frequently becoming unconscious. But neither of these phenomena is a positive sign in either direction. You may find one or both misleading. Cardiac ulcer sometimes gives rise to melæna—blood passing out through the stools—without vomiting. Such instances have been proven by several tests and also by operation. In cirrhosis of the liver, for instance, you find that very often. There are venous ectases, big veins in the esophagus above the cardia, that burst and give rise to hæmorrhage—no vomiting—and you may find the blood in the stools. The patient may even die, and you will find at autopsy that there was bursting of the vessels in the œsophagus. These signs are therefore not positive enough for duodenal ulcer.

I think the thread test is the best means of recognizing the presence of an ulcer and of ascertaining whether it is in the stomach or in the duodenum.

Not all ulcers can be demonstrated with the thread test, however. For instance, an ulcer on the anterior wall of the stomach will not come in contact with the thread and there will be no stain on it. Ulcers, however, situated in the cardia, the lesser curvature, pylorus, or especially in the duodenum, can usually be recognized by the thread test. It would be a great exception if there were a duodenal ulcer present and it gave no blood stain on the thread.

If, however, there is a mere infiltration of the mucous membrane, but no raw surface present, or if the ulcer has almost healed, it would give rise to no stain. But in most instances we can recognize ulcer of the duodenum by the thread.

You recognize the position of the ulceration by the distance of the bloodstain from the lips. A bucket which has sojourned in the duodenum shows at the lower part of the thread near the bucket a decided bile stain, and just above is the mark of blood, if the ulcer is in the duodenum. When taking out the bucket, you should make a mark on the thread at the lips and then you can estimate where the stain was made. The distance from the lips to the cardia is sixteen inches, and to the pylorus is twenty-two inches—that is, in medium-sized patients; in tall persons it would be somewhat greater, in short persons somewhat less.

If you find when you pull the bucket out that there is no bile stain, and that there is no resistance in pulling it out, then the bucket was merely in the stomach, but not in the duodenum. In more than nine cases in ten it will pass if there is no stricture or spasm of the pylorus. If there is a spasm we give the patient atropin, and give the thread again and let him sleep with it, and then take it out again. If we find bile at the end, it shows that it has been through.

X-rays will also occasionally be helpful in establishing a diagnosis of peptic ulcer.

So I have given you these more important points for diagnosis. By employing these means we can discover ulcer more frequently than by any other means we know of.

Now as to treatment, for that is what interests you most. What shall we do with these patients?

You may have cases in which the diagnosis of gastric or duodenal ulcer is made, but the patients do not present many symptoms. They don't suffer much, and they go about their business. They have a little pain and inconvenience, and cannot eat coarse foods, etc. In such cases it may not be necessary to use a very rigorous treatment, for the patient will not follow it. You cannot force him to stay in bed, and he says he has to attend to his business. For such cases we have an ambulatory treatment which can be applied. Of course it is not so good as the more rigorous treatment, but we can use it in appropriate cases. It consists in first giving the patients large doses of bismuth. That is one of the best remedies in all forms of gastric or duodenal ulcer. Give a large dose of bismuth—say half a dram three times a day, combined with six or eight grains of calcined magnesia and then an appropriate diet.

The diet should consist of milk, eggs, cereals, and a great deal of butter, not too much meat, and no heavy foods; no salads, nothing sharp, nothing peppery, no ice water. That would be the principal treatment in these ambulatory cases. You cannot keep a patient who is going about his business on a restricted diet of milk, or milk and broths, for it would not do. A man at his work must have a more considerable amount of food. You can supplement that diet by telling the patient he should lie down for half an hour after taking the bismuth, and if this does not do, he should apply a wet compress over his abdomen at night, to act as a kind of sedative; if the pain is very pronounced, you may add a small amount of atropine, gr. $\frac{1}{120}$, once or twice a day, but that should not be carried out for a long time. Such remedies should be reserved for short periods of time. I saw recently a patient who has been taking atropine for a year, and he has had to increase his dose, and I am not sure that it has not been doing him harm. These strong alkaloids should be used with great care. Atropine has been believed to decrease the acidity, but in this patient there was an acidity of 110; that means more than twice the normal. The prolonged action is injurious. The above treatment covers the mild cases.

We now come to the severe cases. What should be the treatment in those instances where the symptoms are very pronounced and occur principally after hæmorrhages? That is the most serious condition in ulcers, large hæmorrhages. If the ulcer is accompanied by a considerable hæmorrhage, the proper treatment is absolute rest. Put the patient to bed. Don't let him move around much, keep him quiet, put an ice bag over the stomach and abdomen, and forbid all kinds of food and drink. Absolute rest for body and stomach. The medicinal treatment in these cases would be adrenalin, five to ten drops in water, and gelatin which also acts as a hæmostatic. You can give a ten per cent. solution of gelatin, a tablespoonful three to four times a day; subcutaneous injections of blood serum from man or horse—the latter is the easier to be obtained—are likewise beneficial. Then emetin hydrochloride, given subcutaneously once or twice a day in half-grain doses, acts in a similar manner. I have found that very helpful in severe hæmorrhages of the stomach and lungs. How it acts, I don't know, but empirically it does act. Then, if the pains are very severe, we should give opiates—a suppository of opium and belladonna.

In such cases you should not bother about the nourishment for the first day or so, for absolute rest is necessary. Then we institute rectal feeding, and first we have to see that the patient gets enough fluid, especially if he does not get it from the stomach,—we all lose a great deal of fluid through expiration, perspiration, etc.—and we do that best by giving a five per cent. solution of grape sugar, say two tablespoonfuls of sugar to a pint of water, and let it run in slowly (Murphy drip) twice a day. The grape sugar increases the nutritive value of the water; sometimes we give it three times a day. The next day you begin with rectal feeding.

In addition to these water-enemas of sugar or salt, you try to introduce some additional nourishment. You may give five ounces of milk, a raw egg and a teaspoonful of sugar with a little salt; beat it up well and inject it through the rectum, giving two or three such injections a day. The rule is that before you give such enemas the bowel should be washed out once daily, but in these cases of ulceration we don't give large enemas. We wash them out with a pint of water, and let it come out, and a little later begin with these feeding enemas. That goes on for three or four days. An ulcer cannot heal that quickly. The rectal feeding may be prolonged for a week, but if done longer than that there is too much loss of flesh and the patient becomes exhausted. These feeding enemas are all right, but the nutriment from them is not all utilized, perhaps only about one-third of the amount is taken up by the body; the rest is lost from the system, and that is why in rectal alimentation there is no adequate nourishment possible. It is only a help and we cannot resort to it for a long time. It is only good for short periods of time.

Now, what shall we do next? If you are dealing with strong, well-nourished individuals, they will stand that treatment for a week or two and lose twenty pounds, and it will not do them any harm, but where you have to deal with thin and weak individuals, there is danger of their becoming exhausted and dying, and we must resort to other means. After the rectal alimentation, we start them in on the fifth day, say, with small amounts of nourishment by mouth, beginning with strained barley water, milk with barley water, a tablespoonful every hour. The next day, if there is no bad result, give a double amount; the third day, give two ounces every hour, and so move up day by day, until you reach six ounces. Then increase the intervals to two hours and increase the nourishment—milk, koumiss, barley water—to seven or eight ounces. Then you begin to add raw eggs beaten up in milk, and run that up to eight eggs every day, and by that time you have reached a date, two or three weeks after the hæmorrhage, when you can have the patient sit up and give him soft boiled eggs and milk, and increase that diet day by day until you get him stronger and better. When you begin to feed, you start in with the bismuth treatment, as in the ambulatory treatment, giving large doses of bismuth.

Now if you have to deal with patients who have run down a great deal, or if the rectal feeding is not well borne—many patients have diarrhœa, you try first a little opium with the enema, but if this will not go and they continue to have the diarrhœa, what will you do? In these cases we can start in with duodenal alimentation. We can even start soon after the hæmorrhage. I don't like to give it during the hæmorrhage, but would not be afraid to use it two days later. In one case at St. Vincent's Hospital, at the request of the attending physician, I instituted it during the hæmorrhage. The hæmorrhage was so great that the patient almost died, and it could not be checked, and the patient could not stand rectal feeding, so I introduced it at the time of the hæmorrhage, and in aspirating I got blood, but I left the tube in, and the patient got well. I recall another patient from whom I aspirated blood, but I simply emptied the syringe and introduced the food a little beyond the place of hæmorrhage, and he also got well. Hæmorrhage therefore is not an absolute contraindication to the introduction of the tube, for it cannot do any harm, so far as I can see.

There was a patient in the German Hospital who was operated upon for a phlegmon of his arm, and he had a big hæmorrhage from the stomach at the same time. That complicated the case. He had a temperature of 103-4°, and he had a septicæmia with streptococci in the blood. Dr. Willy Meyer asked if I would risk giving him duodenal feeding, as otherwise nothing could be done for him. I said I would try, and as soon as the treatment was instituted so that he could be fed, he braced up and got well. He had fever for two or three weeks from the phlegmon and infection, but he got well. I have no doubt that the duodenal feeding saved his life. So hæmorrhage is no contraindication to the introduction of the tube. It has to be done carefully. If you aspirate, you must do it slowly.

The principle of duodenal feeding is that the stomach and duodenum are kept at rest, including the ulcer-bearing area, and if you treat them this way you give the ulcer the best chance to heal up. You cannot keep the ulcer free from irritation if there is food in the stomach or duodenum. Say you give the patient milk; the milk causes gastric secretion all the time it is there, and the ulcer comes in contact with this irritating material, and there is no absolute rest possible with any kind of food in the stomach or duodenum. If you wish to carry out the principle of rest, you must keep the stomach empty.

As I said before, we can carry out some—although inadequate—feeding below the affected area with rectal alimentation, but this cannot be employed for two or three weeks, and the duodenal feeding is therefore the method of choice. From it we get the best results, for the principle of rest can be absolutely carried out. After the feeding is over, you begin to give them liquid food, and then get on to the ordinary diet quite rapidly, except that heavy foods must be avoided.

We have just discussed the dietetic management of very mild and very severe cases of peptic ulcers and it remains therefore to detail the treatment of cases of medium severity or the average run of cases. Here the Leube rest cure plays the greatest role. Patient is kept abed for about two weeks, on a liquid diet. Warm poultices are applied over the stomach during the day, while at night a priessnitz (wet compress) is employed. I usually give milk, gruels, broths, raw eggs; about seven to eight ounces every two hours. At first four eggs, then eight eggs daily. On the tenth day semi-solid food is added, like farina, soft boiled egg, milk toast. On the fourteenth day some solid food is given, toasted bread with butter, scraped beef, or squab, mashed potatoes; at the same time patient is allowed to be up half an hour to an hour. From now on the diet is quickly increased, in such a manner that within another week patient is allowed to eat most foods, excepting highly seasoned, or too greasy substances.

The Lenhartz diet differs from the one described in that meat and solid foods are given on the third or fourth day of treatment. I personally do not advocate this régime.

With regard to medication, subnitrate of bismuth is our mainstay and is used as above described. Nitrate of silver may also be tried for a period of two to three weeks, but *no longer*. It is given in $\frac{1}{6}$ to $\frac{1}{3}$ grain doses t. i. d., a. c. The patient must be cautioned not to prolong the use of this remedy indefinitely, as argyrosis is apt to develop. In case diarrhœa appears the silver treatment must be suspended. Scarlet red, 7½ grains in wafers may also be employed t. i. d., p. c., either alone or in conjunction with the other remedies. Olive oil, one to two tablespoonfuls twice daily, or liquid paraffin, one-half to one tablespoonful twice daily, are likewise beneficial. The alkalis may be given to combat hyperacidity, and atropin to abate hypersecretion. The latter remedy, however, must be used with caution, and not for too long a time, as already stated above.

While the treatment in peptic ulcers generally is a strictly medical one, their sequelæ may require surgical intervention, the indications for which may be put as follows:

1. Perforation requires immediate operation.

2. Recurrent profuse hæmorrhages (hæmatemesis or melæna or both) endangering the life of the patient require a prophylactic interval-operation.

3. Frequent small hæmorrhages, not being influenced by rational treatment, leading to an appreciable degree of constant anæmia, demand operative intervention.

4. Cases with constant continuous hypersecretion, accompanied by intercurrent ischochymia, not yielding to treatment, should likewise be operated.

5. Severe pains, not influenced to a considerable extent by a repeated course of rational medical treatment, form a strong indication for operative measures.

6. Stricture of the pylorus leading to ischochymia are greatly benefited by surgical intervention (gastro-enterostomy). Beginning benign stenosis of the pylorus can, however, also be treated tentatively by stretching.

7. Ulcer accompanied by tumour-formation and suspected malignancy should likewise be operated.

The French Minister of the Interior has authorized the employment of Belgian physicians on French merchant vessels during the war.

The Umberto I. prize, offered by the Institute Rizzoli, will not be awarded this year. The prize—$700—is awarded by the provincial council of Bologna for the best work or invention in orthopædics.

In October a dispensary was opened at 265 Strand, London, under the auspices of the War Refugees' Committee, for the medical treatment of Belgian refugees. Many Belgian doctors assisted in the work. An official committee has been appointed by the Belgian government to watch over the interests of refugees in England and to coöperate with the Relief Committee.

THE USE OF THE BONE GRAFT IN SURGERY

By W. G. Turner, M.D.

Montreal

THE present communication is more or less a résumé of the great advance in surgery through the application of bone-grafting. Many men have worked on this for years, in defects of the skull, defects of the long bone, and various deformities; but it is really only within the last two or three years that a thorough appreciation of what bone-grafting means has been recognized in surgery. It is a number of years since the transfer of a whole bone was used. You will all remember the historical case of Huntington, in which he transplanted the fibula to replace a defect in the tibia, and how the fibula developed, after some years, to the calibre of the original tibia.

The use of the bone graft, of course, is nothing new in surgery. Ollier, many years ago, used a bone flap with a pedicle, and a certain amount of success was the result. Several other men have also attempted it; among them Witzel replaced part of the clavicle with a graft from the spine of the scapula. Bittner transplanted a large graft from the tibia and turned it down to fill the gap of the resected portion. McEwan, of Glasgow, certainly deserves very great credit for his persistent belief in the future of such repair surgery, and it is very interesting to see that some of his original experiments have almost a practical application to-day. Digressing from my subject, mention must be made of the transplanting of the whole joint apparatus, and the remarkable attempts of Buchmann and Lexer in this direction.

My own first impression of free bone transplantation was in the summer of 1905, when on a short visit to Berlin I visited the Israel Clinic. Israel, that morning, was doing a third stage of a plastic operation on the nose for a complete defect, as a sequel of lupus. In this case, Israel had transplanted from the tibia three bone-plates; these he placed subcutaneously in the arm in a suitable position for a flap transplantation to the nose. Unfortunately,

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Read at the annual meeting of the Canadian Medical Association, St. John, N.B., July, 1914.

I do not remember how long he left the graft in the arm before his first flap operation. However, the three bone-plates were not absorbed, and at the time I saw the operation they remained as a firm skeleton support for the new nose. The flap had been transplanted in the usual way by preserving the skin pedicle in the arm until the suture line had taken.

For a time there was no particular advance until a rib was used as an autogenous graft. Later Albee of New York devised his operation for Pott's disease in which he provided a free and substantial graft taken from the tibia and inserted in the spinous processes of the vertebræ. The remarkable results attending this bone-grafting directed the attention of the surgical world to the variety of conditions in which it might be applied. Its application also in the case of delayed union of the long bones, or non-union, was quickly appreciated. As to the fate of the graft we must again refer to the three chief theories of regeneration of bone; but this surgical work has rather upset even these. Briefly, to mention them, they are as follows: (1) "The bone in the graft always dies, is absorbed and reformed from periosteum, which alone remains living in transplants." (Axhausen). (2) "The bone in a graft is reproduced from the proliferation of osteoblasts, derived from osteoblasts within the bone of the graft itself, and its regeneration takes place independently of the periosteum whose only function is that of a limiting membrane which prevents the spread of the osteoblasts into the surrounding tissues." (McEwan). (3) The "graft is not osteogenetic, but simply osteoconductive. Provided it be in contact at one or both extremities with other living bone, the graft acts simply as a scaffolding for the growth of the capillaries with their osteogenetic cells as they advance from the living contact extremities into the graft. The periosteum takes no part in the reproduction of new bone." (Murphy).

Axhausen's theory is now disproved, as also McEwen's of the physiology of the graft. Murphy's has most weight, though I will take up this later.

Since this bone-grafting, however, we find by carefully studying the *x*-rays of cases that in practically all the cases, the graft persists as a true bone splint. As far as we can make out, there is no diminution in the size and practically none in the density of the bone itself. I was much impressed some months ago by a paper of Geddes, of Dublin, on the regeneration of bone, in which he called attention to the fact that bone was regenerated by osteogenetic cells from all parts of the bone. It appeared as though the greatest amount of regeneration took place in the neighbourhood of the periosteum, sub-periostially, and in the medulla; but, in addition to this, there were very numerous cells of the same character migrating throughout the Haversian systems. Gallie, of Toronto, has made a number of observations also on this subject, and in all his experiments found the graft at first without any circulation and with empty lacunæ—really dead, and in succeeding experiments showed the vascularization of the graft. MacWilliams, of New York, has called attention to the fact that the periosteum is a very important factor. This he did by imbedding portions of ribs in the abdominal wall. The cases which had periosteum were well preserved and living; those, however, which did not have periosteum were absorbed. This corresponded entirely with the plastic case which I cited above from the Israel Clinic. He also emphasizes that good circulation is a very important factor. This is, of course, only common sense, when we consider what repair of bone means. I must say I cannot yet give great weight to the necessity of the periosteum.

Up to the present time the function of the bone graft has been chiefly that of a long splint, used chiefly in defects of the long bones. Now we find that it has a certain application in repair of the patella, in fixation of the sacro-iliac joint, and from the example which I quoted above, seen in 1905, of broader thin plates of bone being used in plastic work, surely there must be some result in the application of the same for defects of the skull.

There are a number of methods for the selection of the graft. It may be taken from the tibia, rib, upper third of the ulna, clavicle or crest of the ilium. The rib and tibia are the favourites, the former for its abundance of vascular cancellous tissue, and the latter for the size of graft available. There are also a number of methods of transplantation, the chief of these being the transfer of free, non-pedunculated, large fragments, with or without periosteum covering at least one side. This is far the most generally employed to-day. Yet it is but just to mention others, some at present discarded: (1) The use of small bone chips with periosteum; (2) The decalcified bone chips of Senn; (3) The use of pedunculated bone flaps; (4) Graft combined with arthroplasty; (5) The shaft of the fibula (Huntingdon); and (6) The transplantation of joints (Buchmann and Lexer).

The indications for the use of bone grafts, according to Murphy, are as follows: (1) To correct deformities resulting from defects of development, as aplastic extremital bones—radius, ulna, humerus, tibia, fibula and femur; saddle nose aplastic mandible, etc.; (2) To produce union in un-united fractures; (3) To replace bone removed by destructive infections; (4) To restore or supplant fragments dislodged or destroyed by fractures; (5) To replace bone removed for certain non-malignant or encapsulated malignant neoplasms; (6) To immobolize joints, as in Pott's disease (Albee) or infantile paralysis.

The ones which we are most interested in are those in which a free graft with or without its periosteum has been transferred. My own experience has been entirely with a graft taken from the tibia, varying in length from four to ten inches, and in width from three-eighths to three-quarters inch. Other operators have selected a rib; both are selected on account of the ease of access and the excellence of the bone graft afforded. In all cases which have come under my service, I have transferred the graft with the periosteum attached. The graft has been carried right through to the medullary cavity of the bone, a minimum of trauma is inflicted, and all the elements of repair are preserved as intact as possible, as suggested by Geddes, of Dublin. To remove the graft the means is certainly simple—a chisel can be readily used. This means I followed in my first five cases, but since then I have used a rotary saw on account of its rapidity of work, accuracy of cutting, and the avoiding of the chance of the bone splitting in a wrong direction. The bone graft has only been removed from its host after the site of grafting has been prepared; then it is quickly transferred into the bed prepared, the periosteum sutured, and the accuracy of the fitting of the graft carefully insured. The number of instruments really is a very simple one but it is wise to add a simple block of wood four by four by two inches, and a saw. By this means you can readily chisel or saw off any excess of the graft. I recommend this after my own experience, since in one case, as I was placing a graft in position, it slipped from the forceps on to the floor. In that case I was using a very thin graft, fortunately, and without any injury to the patient I was enabled to take a second one. In all cases I think it is wise, in addition to suturing the periosteum, also to suture the layer of aponeurosis before closing the skin. One other site on which great stress is usually thrown both in un-united fractures and also in the Albee operation on the spine, is the end of the graft, and this must be carefully secured in its bed. Nothing is more humiliating than after having done a very careful operation, to find that the result of the operation is very much impaired by the slipping out of one end of the graft.

My own experience in bone-grafting has been entirely in cases in which Albee's operation was performed, and in some cases of non-union. In all of these I removed the graft from the smooth surface of the tibia internal to the crest. The reason I chose this site was its simplicity, the fact that in removing the graft I preserved the dense crest of the tibia and, thirdly, that the operator did not invade the muscle on the outer side of the crest. These grafts were then inserted in a furrow, either in the back or else in the non-united bone of the opposite side. The results were very gratifying. In the first place the bone graft persisted; there was practically very little shock to the patient and the functional results were excellent. This has been the experience of many other men who followed exactly the same technique. The reason for favouring this technique was the fact that healthy bone was chosen; there was no trauma in removing the graft or inserting it in its new locality. All the constituent elements from periosteum to medulla were preserved absolutely intact. However, in the surgical clinic in the Royal Victoria Hospital all three of the standard methods have been used with excellent results in each. These methods are: first, the transplant of the bone into a furrow arranged for it in a new locality, as first described by Albee; secondly, the method, described by Buchanan, of Pittsburg, in delayed-union fractures, of moving the graft from the same bone down to make a solid bridge over the fractured area; and thirdly, the methods strongly advocated by Murphy, of Chicago, of enlarging the medulla of each fragment, taking a bone graft from the sound tibia, and inserting it as a peg to bridge between the two fragments. From described cases from various clinics, it appears to me that each method has a distinct place; and the advance in this type of surgery is astonishing in the last three years, filling in the gap of treatment in delayed union from a thorough surgical standpoint. What has appealed particularly to me is the simplicity, and the preservation of all constituent cells where the repair has to take place. The last method does cause a great deal of trauma in the medulla; but the more solid splinting brought about by this method may give the other parts of the bone a better chance for union, to compensate for this trauma. In any case the results are extremely gratifying.

In all my cases the graft has been taken from the patient. The repair of the patient must be at its maximum, and the technique of preparation of patient and operator must be absolutely scrupulous. It must be remembered that any carelessness in this last may lead to infection, grave or slight, of one or both tibiæ, and that serious disability may result.

As to the fate of the graft, MacWilliams, in a recent article in the *Annals of Surgery*, gave a very careful review of his experiences and also experimental work. He emphasized very strongly his opinion that the periosteum was an important factor, not so much the fibrous envelope itself, as the subjacent cells. He held very strongly, as does also Albee, that the bone united in its new position, with its host, even as a fracture does. I was strongly inclined in this belief myself, especially as in one case of spine-splinting the upper end of the graft slipped out of the spinous process above, and the gap was first closed by a bridge of callus, and later by true bone. However, the careful work of Gallie, which he reported last month at the meeting of the Orthopædic Association, must be recognized. In his series of experiments he found in almost every case, that for some time the lacune of the bone and Haversian systems were destitute of circulation, and that this circulation became gradually reëstablished. The emphasis which MacWilliams has laid on the importance of circulation is an important factor. He practically repeated one of McEwan's original experiments of placing bone chips in a suitable environment, and found that a shaft of new bone was the result.

In conclusion I would say that autogenous bone-grafting is a distinct advance, but the operation must be done with scrupulous care; that the graft must be regarded as a bone splint until revascularized from its host, and finally the extent of graft must be judged by the extent of this revascularization.

Discussion:

Mr. Rutherford Morison said that there were still many points requiring investigation before all doubts were removed concerning the use of bone grafts. Two things appeared to be certain: (1) That the graft should be taken from the individual operated upon. The probable explanation of Lexer's failures appeared to depend upon his inability to comply with this requirement. (2) The need for most strict surgical precautions, which had been emphasized by every speaker. Where should the graft be taken from? It if was only, as Murphy said, a framework for new bone, to be laid down upon, the question was not of great practical importance. This was not Mr. Morrison's belief. He thought that the graft was the most important contribution to the new bone formed. If so, it might matter which bone was used—his experience, recorded in Vol. I of the *British Journal of Surgery* recently issued, suggested that it did—and, for example, a good tibia might not result from a rib transplant. It seemed to him that a large bone would not grow from a small one for the same reason as the ovum of a mouse could not be expected to develop an elephant. The vascular supply of the graft appeared to him to be important, and when employing compact bone for the purpose, he had drilled holes at intervals to allow new vessels to get in there.

Dr. Elder said he used a rib because he got bone-marrow to bone-marrow, and so secured, he thought, much more rapid union than when cancellous tissue was used. He agreed with Mr. Morison as to preference for autogenous grafts, but no graft must be too long. If it is, the graft will not remain long enough to serve as a conductor for new bone. As regards technique, he laid great stress upon perfect hæmostasis, attained, if possible, by forcipressure ligatures; buried sutures were objectionable and should be avoided when possible.

Dr. Clarence L. Starr: "If one can feel that evidence produced in experimental work in animals can be used to show what will happen in the human, then my associate, Dr. Gallie, has shown definitely that it does not matter whether the graft is autogenous or heterogenous, as all grafts grow equally well. The graft from the human can be planted into animals, from one animal to another, and even boiled grafts may be used. The graft dies, is revascularized from the tissues into which it is planted, and osteoblasts follow, the bone cells being laid down from the edge of the graft. As the compact tissue is invaded it becomes cancellous and gradually disappears, new bone being laid down as the old disappears. These experiments certainly open up a new field of possibility in bone work."

The Dietetic and Hygienic Gazette, which has just completed the thirtieth year of its existence, has been purchased by the Critic and Guide Company, with which it has been consolidated. Beginning last month the combined journals will be under the editorship of Dr. William J. Robinson, and will be published at 12 Mount Morris Park West, New York City.

BONE WEDGING—A METHOD OF ELIMINATING THE INTRODUCTION OF FOREIGN MATERIALS IN OPEN OPERATIONS ON FRACTURES

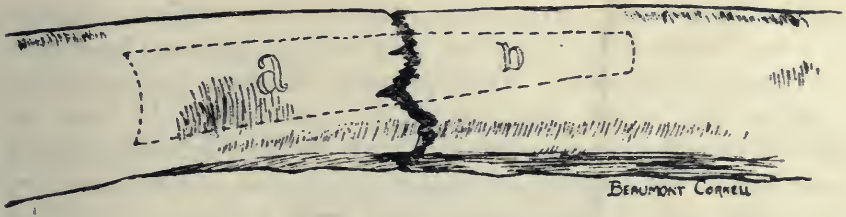
By W. E. Gallie, M.B.

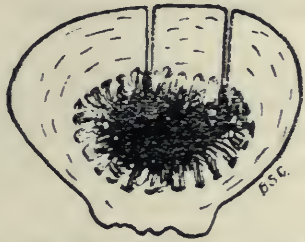
Associate Surgeon, Hospital for Sick Children, Toronto

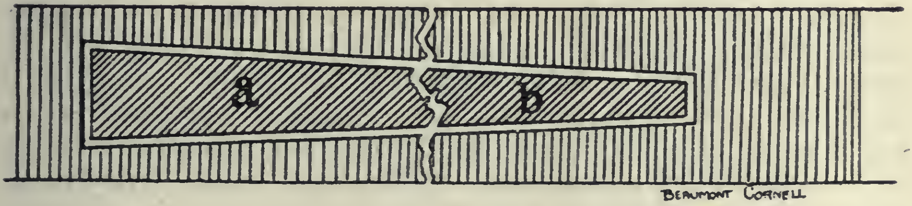
IN performing open operations on fractures it has become the practice of the writer to avoid, whenever possible, the introduction of foreign materials into the wound. The frequency with which such materials have to be removed weeks and months after the operation, is sufficient argument that if the fracture can be successfully treated without them, they should be omitted.

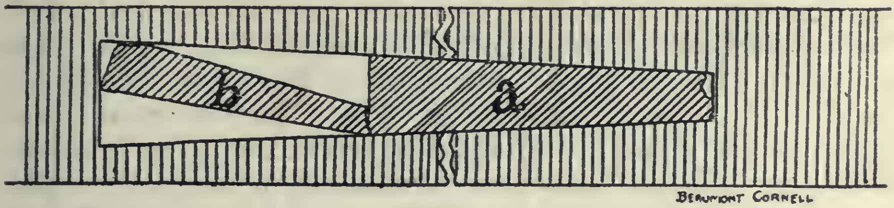
The fractures which most frequently require open operation are the transverse or slightly oblique fractures of the long bones. The long oblique fractures naturally assume proper alignment under traction, owing to the lateral pressure exerted on the tapered ends of the fragments by the taut muscles. While the transverse fractures are easily reduced under anæsthesia, it is not so easy to hold them in position and it is very common to find that a few days after the complete reduction of a transverse fracture, the ends of the fragments have slipped past one another in spite of the most careful application of traction and external fixation. It was for such fractures as these that the method herein described was employed.

When such fractures present themselves for treatment they are skiagraphed and, under anæsthesia, reduced if possible. If the ends of the bones have been caught on one another, and if the skiagram shows satisfactory reduction, a long plaster spica is applied, with the limb in whatever attitude the location of the fracture demands. A skiagram is then taken through the plaster and if the bones are in reasonably good position, the patient is returned to bed. A few days later another skiagram is taken and if the fragments are still in good position no further trouble need be anticipated. If, on the other hand, when the patient was first anæsthetized, the bones could not be firmly adjusted or if after a few days the skiagram shows that the fragments have slipped, the patient is taken to the operating room and the following operation performed:









Through a free incision the ends of the fragments are exposed and with the aid of Lane's bone forceps, the fracture is reduced. While an assistant holds the bones in correct attitude, the surgeon applies a motor saw to the fragments, cutting out two pieces, as shown in the accompanying diagram. Each piece is wedge-shaped and the planes of the sides are perfectly parallel. The piece *A* is now driven solidly into the space left by the removal of *B*, and owing to its tapering shape, it wedges itself solidly into both fragments and thus dovetails the fracture together. The piece *B* is then dropped in behind *A* to assist in holding it in place. This is not an intramedullary splint, as the operation, to be successful, requires the hard bone of the cortex to hold the wedge properly. The incision is closed in the usual way with catgut and horsehair and a plaster spica applied. This operation has been performed on six occasions and so far has been quite successful. It must be remembered that it is not applicable to all types of fractures, being quite unsuited to comminuted or slivered fractures, but for ordinary transverse fractures, it provides a very good method of securing fixation of the fragments without the introduction of foreign materials of any kind.

At Ottawa the new board of health met for the first time on Thursday, January 14th. The increase in the number of cases of diphtheria and scarlet fever, and the consequent deaths, was discussed. Mr. Smith and Dr. Robertson undertook to investigate conditions at the Isolation Hospital. Critisicm was made of last year's board of control in so far as they had interfered with the work of the health department. The present mayor, Mr. Porter, thought that no difficulty would arise this year in this connexion. It was recommended that the board of control should not deal with health matters before obtaining a report from the board of health. It was decided to ask the Ontario Board of Health to get into communication with the Quebec board, to see what could be done in regard to the typhoid epidemic at Aylmer, for the protection of Ottawa's water supply. During the month of December there were nearly three times as many cases of smallpox in the province as in December of 1913, and there were two hundred more cases of diphtheria.

On January 1st, 1915, the editorial and business offices of the *Boston Medical and Surgical Journal* were removed from 101 Tremont Street, to 125 Massachusetts Avenue, Boston, Massachusetts.

EARLY DIAGNOSIS OF TUBERCULOSIS

By D. Townsend, M.D.
River Glade, N.B.

As tuberculosis is such a prevalent disease and the onset so insidious, it is essential, in making our diagnoses, constantly to bear in mind the possibility of its presence. It is safe always to think of tuberculosis, if for no other reason than to exclude it. In this way fewer mistakes in diagnosis will be made and fewer cases overlooked. No matter what the symptoms may be, a thorough chest examination should be made. Especially is this true on the first visit and where there is a tuberculous history. The disease is often found where least expected. Individual symptoms do not mean tuberculosis. It is only by carefully weighing the data obtained by examination and a careful history of the case in all its aspects that we are enabled to make our diagnosis. In cases of doubt, in my opinion, it is always safer to treat the case as if it really were tuberculosis; if this is done there will be fewer advanced cases. In making an examination three things should always be done, chest examination, sputum examination, and the registration of the pulse and temperature.

Family history, as to tuberculosis, is always important. The previous history of a patient should be carefully studied, as well as his mode of living and occupation. In this connexion, a history of personal contact with a person who has had tuberculosis, particularly if it be an advanced case, also a history of previous cases in the same house, may be of assistance. Poverty with all its consequences, underfeeding, deficiency of sunlight, defective ventilation, mental overwork or fatigue and physical exertion from whatever cause, occupations where there is much dust mixed with the inhalation of impure atmosphere, dissipation with disregard for the laws of health, and irregular meals, bad home surroundings as to dirt, filth and overcrowding, all predispose to the disease. Attacks of fever, transitory in type, especially if present in the afternoon, or a mild fever persisting for some weeks without any

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Read at the Annual Meeting of the Canadian Medical Association, St. John, N.B., July 7th, 1914.

apparent reason, particularly if accompanied by malaise, one or more attacks of pleurisy, no matter how remote, and a previous history of bronchitis, if unilateral, as well as frequent colds, are always suspicious.

The symptoms of early tuberculosis are somewhat indefinite and usually extend over a more or less protracted period. The first warning may be the coughing up of blood. A slight cough, with or without expectoration, not always short or dry, may be present and precede the attack for some time. The cough may be constant or intermittent. The sputum, if any, is usually at first mucous and greyish in colour and present in the early morning or after fatigue or exertion, and is brought up either by coughing or simply clearing the throat, or there may be only a feeling of fulness in the throat. There are disturbances of the circulation with rapid pulse, and later disturbances of the digestive tract with foul-smelling stools, loss of appetite, which may be transitory or persistent, and disturbances of the nervous system; the patient is easily excited, reddens on being spoken to, and sweats profusely on examination. There may be, and usually is, loss of weight, loss of energy and a slight rise in temperature in the morning or afternoon or after meals or exertion. There may be susceptibility to catarrhal attacks which start as a cold in the head or laryngitis, gradually working downwards and finally, settling in the affected area, or extend to the bronchus, giving a bronchitis which runs a more or less protracted course. This tendency may exist for months before tuberculosis is suspected or the bacilli appear. Such cases are suspicious, to say the least, especially when there is a tuberculous history. Pain over the affected area may exist for some time, and is either constant or remittent or brought out by pressure. It is usually limited to the apices and is neuralgic or rheumatic in type leading to a diagnosis of "rheumatism," or it may be found between the scapulæ. It is either localized or, when present at the apices, extends to the shoulder and down the arms. The pain is due to a localized pleurisy.

Examination of the patient in doubtful cases is best made in the early morning after waking, and subsequent examinations should always be made at the same time. At this time slight processes are readily detected and any rales or secretion present are not removed as they would be after exertion or later in the day. The chest should be completely bared and the patient placed in a strong light. This is essential for the detection of whatever abnormalities may exist. The general condition of the skin as to nutrition and appearance and the shape of the chest is important. The skin is drier than normal and the thorax is narrow with slight depth but greater length and wide intercostal spaces with a thin layer of fat or slight muscular development. The scapulæ are prominent and their inner edges protrude more than normal, giving a wing shaped appearance. There may be local flattenings or depressions and a retraction of one apex or emphysematous pads above clavicle. The muscles of the neck and thorax on light percussion are found to be more rigid than on the sound side. This indicates fresh active disease (Pottenger). Swelling of the thyroid is seen early in the disease. The chest should measure in circumference one half the height, if less, then we have a weak chest and one predisposed to tuberculosis. On breathing, especially on inspiration, the affected side or apex lags, expansion of the chest is restricted, and the excursion at the base of the lung on the affected side is usually limited. The more recent the disease the more evident the limitation.

The percussion note shortens at first then goes on to dulness with increased infiltration, it may be slight or relative or intense and absolute, that is, the underlying tissues are more or less airless, or it may be tympanitic, as a result of diminished tension. This is best brought out on light percussion. Percussion over the clavicles in unilateral apical disease will determine the affected side. The chest should be systematically percussed from apex downward and each side over the same areas carefully compared. In cases of doubt at the apex, commence at the bottom of the chest and percuss upwards, in this way you will gradually pass into the affected zone. Percussion informs us of the density of tissue and must be made with auscultation for accurate results.

During auscultation the patient should breathe through the nose, easily and a little deeper than normal. As in percussion, both sides are to be compared in corresponding areas. The breath sounds are not clear, or they may be hoarse vesicular, and are often vibratory in character. This may exist, even before percussion reveals any changes. Weak inspiration is next in importance. Care should be taken that this is not due to nasal obstruction or a plugging of a bronchus. Cog-wheel respiration may be present and is due to large areas of defective function in the neighbourhood of infiltrations; it is an evidence of tuberculosis, especially if confined to one apex. In early conditions expiration is frequently still unchanged but, as a rule, it becomes markedly bronchial later than inspiration. As soon as infiltration is established it becomes more bronchial in character. Prolonged expiration is characteristic. Diminished respiration at the apex, unless due to nasal obstruction or a plugged bronchus, in the young means activity, in the old, a healed lesion. As soon as contraction takes place you get a narrowing of the apical outlines. Râles may not come until late in the disease; the disease may exist for a long time solely in the form of chronic infiltration as shown by auscultation and percussion. Râles, if present, consist of a simple click, at the extreme end of inspiration, or persistent fine crepitations; they may take the type of a sharp groan or whine and are brought out only after repeated coughing. They are commonly heard above or below the clavicle or posteriorly above the scapulae, or at the bases, or over a bronchus, or in the axilla. In the latter region other conditions may give rise to the same signs, therefore we should be cautious in making a positive diagnosis of tuberculosis in these areas and only after repeated and careful examinations and a weighing of all the data in our possession. A chronic pneumonic process at the apex is tuberculous, if at bases the diagnosis is made from the fact that there is no crisis and the process does not clear up as it should. Râles, which on repeated examination are constantly heard limited to a definite area, are suggestive. Whispered voice sound is important. Subclavian murmur, a systolic blowing murmur, heard over the subclavian artery, more often heard above the clavicle and produced by adhesions of both pleural surfaces to each other and to the wall of the subclavian artery, indicates apical tuberculosis.

Repeated sputum examinations in all suspected cases are indicated and essential, and should be done as a routine measure. Absence of bacilli does not exclude tuberculosis and their presence usually indicates a more or less advanced condition of the disease.

In doubtful cases tuberculin may be employed, as follows:

(*a*) The skin test of Von Pirquet, of more value in children than in adults.

(*b*) The conjuctival test, which is too dangerous to be employed as a routine.

(*c*) The subcutaneous test. The dose for the first injection is 0·2 c.mm. The reaction consists of (1) A reaction at the point of injection; (2) A febrile reaction, a rise of 1° F.; (3) A general reaction, headache, malaise, chill, etc.; (4) a reaction at the seat of disease, increased activity. The febrile and general are most often met with and the focal reaction is the most trustworthy.

Tuberculin is contra-indicated in the following conditions: a temperature of 99·2° F. oral or 99·8° rectal, recent hæmorrhage from mouth, heart or kidney disease, epilepsy, or severe cases of hysteria or neuresthenia; miliary or active tuberculosis, diabetes or arterio-sclerosis, and in convalescents and persons weakened by severe disease. *X*-rays may also be employed to corroborate the physical findings. With regard to the type of cases suitable for admission to a sanatorium, the following may be of service: Cases with early physical signs in which there is no evidence of temperature, even after exertion, and cases where the lesion is not far advanced, which have (*not*) existed for over six months, and where no temperature is evident except after exertion, and then only a small rise. All other cases are best kept under observation at home, and then if they improve may be given a trial later.

A DELEGATION from the Winnipeg General Hospital recently waited on the health committee with the request that an asylum for inebriates be provided. The hospital receives such patients, although many general hospitals refuse to do so, but it possesses no facilities for their proper care and treatment and frequently they are a source of great annoyance. Moreover, the majority have no settled abode and the cost of their maintenance falls on the hospital. It was proposed that the city should open an isolation ward in connexion with the General Hospital and should provide a special attendant, barred windows and a padded cell. The matter was left in the hands of Dr. Munroe who will report upon it at the next meeting of the committee.

AN outbreak of smallpox occurred in December in the Indian settlements on Lake Winnipeg; a few cases also occurred at Selkirk. A strict quarantine was established and the spread of the disease was soon checked. The source of infection was found to lie with an Indian named Guvnor who was travelling through the district.

Case Reports

SEPTIC THROMBO-PHLEBITIS OF THE PORTAL VEIN, COMPLICATING GANGRENOUS APPENDICITIS

By B. H. Champion, M.D., C.M., and J. J. Mason, B.A., M.D.

Vancouver

PYLEPHLEBITIS is possibly a more common complication than the reported cases would indicate. In this article we are not concerned with the complication occurring in other morbid processes of the gastro-intestinal tract, but only following appendicitis. The veins of the caput coli and appendix are all tributaries of the portal system and considering the frequency and severity of infections in this region it is surprising that the complication is not more common.

The pathology of the condition is readily understood if we study the anatomical arrangement of the portal vein and its tributaries. The ileo-colic vein carries the infection to the superior mesenteric and thence to the portal vein. We possibly get two more or less distinct types. In the first type the thrombus formation is early and extensive with the clot later breaking down filling entirely the portal vein with almost pure pus. In this type localizing liver abscesses appear to be infrequent. In the second type the thrombus is much less extensive, being limited to the contiguous terminal branches of the ileo-colic vein with a comparative freedom of extension to the portal vein, which acts only as a carrier of the infective emboli. In this type liver abscesses appear more common and are more easily localized. It is much less severe than the other type. In reviewing the reported cases we are impressed with the varying intensity of the lesion in vein and liver.

The history of a gangrenous or acute appendicitis in which, at operation, the mesentery of the appendix was found gangrenous, or congested and friable, followed by an early apparently normal convalescence, to be later characterized by recurring, irregular chills, fever and sweats, with intervals of normal temperature and improvement, associated with a clean tongue and negative signs of peritoneal involvement, is usually sufficient for diagnosis. The temperature chart is almost diagnostic in itself. The liver should be aspirated through the eighth or ninth interspace about the axillary line, not more than one and one-half inches from the costal margin. These tappings in many cases will be negative, but should be persisted in at intervals. There is no doubt that some of the cases classed as secondary peritoneal abscesses are in reality septic thrombo-phlebitis of the portal vein.

Johnson,[1] Murphy,[2] and other authorities affirm that the condition is invariably fatal. Parker Symes[3] reports a recovery from draining an hepatic abscess secondary to appendicitis. In the discussion that followed a report of his case, Dowd suggested the possibility of the complication being not necessarily fatal and cited a case under his care, while Boutillier mentioned an apparently similar type to the one we are reporting. Bidwell,[4] of London, England, reported a recovery from a liver abscess secondary to appendicitis. However, were not these recoveries cases of the type in which the thrombo-phlebitis involved only a radicle of the portal vein proper? Are we drawing an unnecessary distinction?

If liver abscesses complicate the process and could be localized, they should be drained with some slight assurance of success. In the distinct thrombo-phlebitic type, Neuhof[5] suggests the possibility of ligaturing the portal vein or draining its contents. His excellent article, along with the experience of our case with its post-mortem findings, makes us think that surgery may yet be successful in this hopeless complication. Moreover, we feel the diagnosis can be made relatively early. We realized that our case was well suited for the attempt but we lacked the courage of our convictions. We are hopeful, also, knowing that surgery has been successful in septic thrombosis of otitic and puerperal origin. The gradual occlusion of the lumen of the portal vein by the enlarging septic thrombus, allowing a collateral circulation to be established, eliminates the danger of the sudden ligaturing of the vein. The disease accomplishes what Neuhof in his experiments produced.

Case Report

G. G., aged forty, gave a history of four attacks of abdominal distress in the past two years. Each attack was ushered in with nausea and later there was pain, contrary to the usual order in appendicitis. The attacks were of short duration and the recovery was apparently complete. This present attack began at 5 a.m., April 11th, 1914, with nausea and soon afterwards abdominal pain. He took a purgative pill which caused him to vomit. One of us saw him at 12 noon, when he presented great abdominal pain and rigidity, general in distribution. The temperature and pulse were normal. On the evening of the same day he had a temperature of 100° and pulse of 100. Tenderness and rigidity were more marked over the lower right anterior quadrant of the abdomen. On April 12th at 2 p.m. when we saw the patient together, he had no pain, discomfort, tenderness or rigidity. The patient remarked that he was all right. We decided to wait at least a few hours for a more definite indication to interfere. At 9 this same evening he had a normal pulse and temperature and presented neither tenderness or rigidity on examination. The next day, April 13th, contrary to orders, he got up and soon afterwards had a chill. An hour later his temperature was 102° and his pulse 116. Examination showed some rigidity over the right side. Operation was urged as soon as possible. His leucocyte count was 14,000 with 80 per cent. polymorphonuclears. On opening the abdomen, through a muscle-splitting incision over McBurney's point, a loop of small bowel shoved into the wound. This was replaced and the appendix located posterior to the cæcum, and intimately adherent to the postero-lateral abdominal wall and to the mesentery. It was separated and removed with more than ordinary oozing. It showed a marked constriction at the centre and was becoming gangrenous to within a quarter of an inch of the cæcum. The mesentery of the appendix was congested and friable. The wound was drained. The patient was put in Fowler's position and Murphy's drip administered. His post-operative convalescence was normal until the third day (April 15th) when he had a chill and later a temperature of 100·2°. The chills were irregular, occurring on the following days after the operation: the 10th, 14th, 15th, two on the 17th, 18th, 20th, 23rd, 24th, 25th, 27th, 28th, 29th, 34th, 36th, 37th, 39th, two on the 40th, 41st, two on the 42nd, 43rd, and 44th. The temperature was always elevated after the chill, frequently to 104° or 105°, but immediately afterwards fell to normal or sub-normal. A drenching sweat always accompanied the fall in temperature. The pulse was good at all times and remarkably slow even at the height of the fever.

We profited by Murphy's dictum, as given in Keen's "Surgery," that the humiliation of exploring for secondary abscesses could be prevented by studying closely the temperature chart and finding negative signs on an examination of the abdomen. The similarity of the chart to that of jugular thrombosis was marked. We made a provisional diagnosis of portal thrombo-phlebitis on April 18th.

The drainage wound sloughed and a small fæcal fistula developed which, however, later closed. We aspirated the liver on May 3rd and again on May 9th without finding any pus. The patient early had deep jaundice which later cleared up to a great extent. He had no pain over the liver and in reality suffered very little during his illness and did not appear critically ill except following the severe bouts of chill, fever and drenching sweat. The urinalysis was negative during our care. He died on June 15th, almost two months after the onset of his illness. The last three weeks of his life he was removed from our hands and placed under the "Christian Science healers," who promised a sure cure for the case that the doctors had given up. If our diagnosis should have been wrong, and with the diagnosis the attendant prognosis, one of the curses of our society, who are neither Christian nor scientific, would have had an alluring advertisement.

We were fortunate in being able to obtain an opportunity of opening the abdomen after death. The fæcal fistula had healed completely. There were no apparent macroscopic abscesses in the liver, although we did not systematically examine it. The portal vein and its tributaries were filled with pus and an occasional broken-down blood clot about the size of a split pea. The gall-bladder was normal.

References:

1. Johnson, "Surgical Diagnosis," Vol. 1, p. 99.
2. Murphy, Keen's "Surgery," Vol. iv, p. 793.
3. Symes, *Annals of Surg.*, June, 1909, p. 856.
4. Bidwell, *Brit. Med. Jour.*, August 27, 1910, p. 507.
5. Neuhof, *Surg. Gyne. and Obst.*, May, 1913, p. 481

MANITOBA MEDICAL ASSOCIATION

The annual meeting of the Manitoba Medical Association will be held on Thursday and Friday, February 18th and 19th, in conjunction with the midwinter meeting of the Winnipeg Medical Society. The programme will be largely clinical. Dr. H. A. Gordon will deliver the presidential address.

Editorial

AN IDEAL MILITARY HOSPITAL

THE universities of Canada, like those of the Mother Country, have responded whole-heartedly to the call. At the close of this session there will be available large numbers of students and graduates whose training in the university battalions will render them particularly valuable additions to the Expeditionary Force. Nor have the needs of the Medical Corps been overlooked. Many, and students as well as teachers, are already on service with the hospitals and ambulances, and active preparations are being made for future calls. At Toronto, for instance, some fifty men of the final year are at present undergoing the training, in groups of twenty, so as to be qualified on graduation for commissions as medical officers. That all may ultimately be needed there seems, unfortunately, little room for doubt. In addition to the units which have been sent abroad and those already recruited to leave with the second contingent, the War Office has recently requisitioned two further units from Canada, a clearing and a stationary hospital.

An offer, which was apparently unprecedented, was made to the authorities some three months ago by the Medical Faculty of McGill to supply the entire personnel of a general hospital on the lines of communication. The officers were all to be members of the teaching staff and able to speak both French and German, the nurses to be chosen from among the graduates of the Montreal General and Royal Victoria Hospitals, and to have a practical knowledge of French, while as many medical students as required would be available as dressers. Needless to say, this patriotic offer was accepted at Ottawa and also by the War Office, and word came to proceed with the organization so as to be ready to leave in the Spring.

Such an undertaking was not entered into by the Faculty without due consideration of the difficulties and the sacrifices it would entail. But though some unforseen complications arose to delay active preparations, these have now been overcome. With several of its members, including two professors, already on service, the choosing of the twenty officers has been a delicate task for the Faculty and the Boards of the two hospitals. Their problem has been to give of their best without crippling too seriously the teaching in the school and the work of the hospitals. Announcement of the personnel awaits the final approval of the military authorities. The matron and forty-two nurses have been chosen from among treble that number of applicants, and each will have a month's military training at the government hospital in Quebec. Students to the number of a hundred and thirty have volunteered, many of them for the humble duties of an orderly; some thirty-five to fifty will be chosen from the final year as dressers, laboratory assistants, etc. Arrangements have been made to graduate these men before leaving, probably in April. The normal accommodation of a general hospital is five hundred and twenty beds, with an emergency capacity of at least one thousand, and the entire equipment must be taken from this side. Not the least important of the many details of this equipment, and one which gives an indication of its thoroughness, is the provision of a number of horses to be used for the preparation of antitetanic and other necessary sera.

The advantages of a compact and homogeneous unit such as this are many and obvious. The officers will be specially trained men, congenial, and accustomed to working together. The staff will be like a well trained team; and the entire establishment will have from the outset an *esprit de corps* which will stimulate all to make the best use of their wonderful opportunities for scientific and practical work. Where so much depends on the commanding officer, the hospital will be fortunate in having at its head the dean of the faculty, Dr. Birkett, in whom are combined all the qualifications one could ask—administrative ability, long years of enthusiastic military service, professional attainments, together with those qualities of heart which inspire devotion; and withal, a modesty which will doubtless be outraged by any such catalogue, however incomplete, of his virtues.

Sir William Osler, whose interest in Canada and his alma mater never flags, has written with characteristic enthusiasm to Dr. Birkett offering his services as supernumerary if the hospital should be called on to cope with an outbreak of his favourite enemy, typhoid. The Minister of Militia and all the authorities have not only approved of the project, but have given the faculty their cordial coöperation. And, finally, H.R.H. the Governor-General has graciously expressed his interest and has signified his intention to inspect the unit when the work of organization is complete.

THE MANUFACTURE OF SALVARSAN IN CANADA

EARLY in August of 1914 the German government placed an embargo on the exportation from Germany of a number of preparations of special service in medicine and surgery on the ground that they might reach the countries at war with Germany and Austria and assist in maintaining the effectiveness of the military forces battling against the armies of those two states. Amongst the preparations whose export was thus forbidden were carbolic acid, serums, certain synthetic drugs, including salvarsan, the greater part of which came from Germany. As a result of this embargo the supply of these preparations became the subject of concern, not only to the medical profession, but also to the public throughout the United States and Canada, and, in consequence, attention was directed to the possibility of their being produced in America. The processes involved in the manufacture of a number of these preparations are covered by patents issued to Germans and German firms by the United States, and as the United States is not at war with Germany these patents could not be set aside, and further, the German patentees could not undertake their manufacture in the United States. In Canada, however, these patents, owing to the state of war between Great Britain and Germany, could be declared to be in abeyance and the matter of manufacturing such preparations was, therefore, a question of their being made in Canada in quantities and at a cost which would justify such manufacture being undertaken on a business basis.

The amount of salvarsan in Canada since August has reached the vanishing point and this has led to very high, almost prohibitive, prices being charged for the quantities of it which have been used recently. Foreseeing the early exhaustion of the supply, Dr. C. K. Clarke, superintendent of the Toronto General Hospital, urged Mr. E. Neil Macallum, son of Professor A. B. Macallum of the Biochemical Department of the University of Toronto, to apply for the licence to manufacture this compound for Canada, and to begin to produce it at the earliest possible date. Mr. Macallum is a synthetic organic chemist of special training and experience, having studied, since graduating from the University of Toronto, for several years under Professor Schultz in Munich and Professor Perkins in Manchester and Oxford, and he is, therefore, highly qualified for the task he was urged to undertake; but before accepting it he began to experiment with the manufacture of the compound on a small scale in the Biochemical Laboratory of the University, and on finding that its production, though exceedingly difficult, owing to the delicate technical processes involved, was feasible, applied for the licence to manufacture the drug for Canadian use. The Commissioner for Patents at Ottawa has recently granted the licence and Mr. Macallum and Mr. Newton Candee, another synthetic chemist, graduate of the University, who now form the Synthetic Drug Company of Toronto, are engaged in preparing to supply this drug for the Canadian market, under the name of "*Diarsenol.*" As the drug is, except in its purest form, very toxic, they are undertaking that their product shall be equal in every respect to the German product, made under the supervision of Professor Ehrlich, the discoverer of the compound, and for this purpose they have made arrangements with Professor McPhedran, the head of the Medical Department, and Professor J. J. Mackenzie, the head of the Pathological Department, of the University, to test biologically and to standardize every quantity of salvarsan which they make, before allowing it to be used on patients. The Synthetic Drug Company is now making the compound and the biological tests are being carried out in the pathological laboratories of the University and the Toronto General Hospital. The wholesale price of the drug, which is based on the present cost of the material used in its manufacture, and includes a royalty to the German patentees, has been fixed by the Commissioner of Patents and is only slightly in advance of the wholesale price current before last August. So soon as the supply of "Diarsenol" meets the present demand, the company will undertake to place neosalvarsan also on the market.

THE CANADIAN RED CROSS

THE January number of the *Canada Lancet* contains a concise account of the Canadian Red Cross Society and its work by Colonel G. Sterling Ryerson, president of the Society. The Canadian branch of the British National Society for aid to the Sick and Wounded in War was organized by Colonel Ryerson in 1896. Its present name was given in 1909, when its organization was enlarged and completed. The branches, provincial and local, now number one hundred and sixty-five and are scattered from end to end of the Dominion. The Canadian society is affiliated with the British Red Cross Society, but it is not a branch of that organization. To use Colonel Ryerson's own words, it "has for its aims and objects to collect funds and material and to provide assistance in time of war." During the South African war, the Society expended $30,000 in various aids to the sick and wounded and sent large quantites of medical supplies to the front. Prompt action was taken on the declaration of the present war and the collection of money and supplies was commenced at once. Supplies were sent to the hospitals at Valcartier and Quebec and when the first contingent embarked the hospitals carried with them large quantites of stores supplied by the Society. Since then supplies have been forwarded to the Canadian Red Cross Commissioner, Lieutenant-Colonel C. A. Hodgetts, in London. These supplies are drawn on by the Canadian hospitals or are distributed to the British Red Cross Society on requisition. The Central Executive, which consists of seven members chosen to represent the eighteen members of the Central Committee, has been able to forward $75,000 in cash to the British Red Cross Society. "It has also supplied twelve motor ambulances, at an average cost of $2,000, to the British society, and has supplied seven motor ambulances and a complete motor kitchen to the Canadian contingent. These latter ambulances are somewhat larger and more powerfully engined than those given to the British society, costing $2,500 each, whereas the motor kitchen cost $3,500. The executive have paid the cost of one coach in the Red Cross train, viz., $9,500. In addition they have provided all the equipment of the Duchess of Connaught Canadian Red Cross Hospital at Cleveden, Berkshire, at a cost of $10,000. Large quantities of supplies have been ordered to be sent to the Queen Mary Canadian Military Hospital at Shorncliffe, and to the Franco-Canadian Hospital at Dinard, Normandy." In conclusion, Colonel Ryerson points out that the Red Cross is "the sole means of communication between the public and the sick and wounded, and aids all wounded, irrespective of creed, colour, race or country." "Its work is confined under British law to the sick and wounded only. The comforts of the fighting man in health is cared for in this country by the Canadian Women's Patriotic Service League, and the distributions are made by the Canadian War Contingent Association in England."

OUR BELGIAN CONFRÈRES

THE German attempt on Belgium failed in its chief purpose, but, with the cry of *Kultur*, it succeeded in converting a land of industry and prosperity into a tract of desolation and ruin; it left a land of suffering and sacrifice and a people in great distress. In all this the medical men have to take their part and the appeal made by Professor Jacobs, published at page 890 of the *British Medical Journal*, issue of November 21st, gives some idea of the misery that has fallen upon them. There were some four thousand eight hundred medical men and one thousand eight hundred pharmacists in Belgium. Between one hundred and fifty and two hundred doctors are now in England and a large percentage of the others are still in their country, trying to help their compatriots, without food, clothing, or even shelter. One case is recounted of a doctor and his wife who had subsisted for three days on wayside herbs! Moreover their instruments and supplies have all been stolen. The same is true of the pharmacists.

Upon the representations of Professor Jacobs, delegate of the provisional relief committee in Belgium, on November 4th, a meeting was held in the offices of the British Medical Association in London to consider the position of Belgian medical men and pharmacists involved in the ruin that has fallen upon their country. The most practicable means of offering assistance were considered and a committee was appointed to communicate with the Belgian Minister and the authorities of the Belgian Relief Fund, and to apply to America and other countries for assistance in the raising of funds. Since Belgium was largely occupied by the Germans, it was not feasible to send assistance in money as there was no way of ensuring that such money, if sent, would not fall into the hands of the invaders. A fund, however, has been opened and up to the time of writing £2,654 has been subscribed. About fifty packets of drugs and dressings have been prepared by Messrs. Burroughs, Wellcome & Company and have been forwarded to Belgium. It is estimated that two thousand of these packets are really needed and the cost of each one is $25. Should the first consignment reach those for whom it is intended, others will be sent later. In the meantime, the appeal for subscriptions is meeting with a generous response. Apart from the monetary assistance given, homes must be provided for the refugees, and members of the profession—there are thirty-thousand British practitioners—are offering hospitality to their Belgian colleagues with their families. The London School of Tropical Medicine has placed its hostel at their disposal and those who avail themselves of the offer are invited to attend any lectures that they may wish to hear.

At the request of Sir Rickman Godlee, a central executive committee for Canada has been appointed to coöperate with the committee for Great Britain and Ireland. The Canadian committee has issued a circular, requesting that local committees be appointed to collect subscriptions from physicians and manufacturing and retail druggists towards the funds intended to enable Belgian physicians and pharmacists to carry on their work, as soon as the military and political situation will permit of their so doing, and to help the refugee doctors in England "most of whom have nothing in this world left to them." Any amount, however small, will be gratefully accepted. Subscriptions should be sent to the honorary treasurer, Dr. D. J. Gibb Wishart, 47 Grosvenor Street, Toronto. The chairman of the committee is Dr. Herbert A. Bruce.

An appeal is made also for instruments,—midwifery instruments, tooth forceps, scalpels, scissors, forceps of all descriptions, and for surgical dressings, bandages, medical and surgical appliances such as clinical thermometers, stethoscopes, ordinary needles, hypodermic needles, suturing materials. These should be forwarded to Dr. Walter McKeown, 7 College Street, Toronto, who is the secretary of the committee. Arrangements will be made to forward such appliances to the London Committee together with material such as absorbent cotton and lint, which will be sent by the pharmacists.

The following subscriptions have been received by Dr. Gibb Wishart: Dr. H. A. Bruce, $50; Mr. P. C. Larkin, $50; Dr. D. J. Gibb Wishart, $50; Dr. R. A. Reeve, $25; Dr. K. McIlwraith, $25; Dr. King Smith, $10; Dr. Geo. Porter, $5; Dr. Dowell, $10; Dr. C. A. Warren, $5; Dr. W. H. Harris, $25; Dr. R. C. Griffith, $10; Dr. E. R. Frankish, $5; Dr. E. R. Hooper, $5; Dr. J. G. Caven, $5; Dr. T. A. Davies, $5; Dr. W. H. B. Aikens, $25; Dr. Mortimer Lyon, $5; Dr. Robert Home, $5; Dr. E. A. P. Hardy, $5; Dr. A. O. Hastings, $15; Dr. G. P. Sylvester, $5; Dr. Gordon Rice, $5; Dr. Allen Baines, $10; Dr. A. J. Johnston, $5; Dr. B. E. McKenzie, $10; Dr. C. J. Currie, $5; Dr. C. E. Treble, $10; Dr. C. S. Hawkins, $5; Dr. J. H. McConnell, $15; Dr. F. A. Cleland, $10; Dr. A. T. McNamara, $5; Dr. W. J. Defries, $5; Dr. G. H. Gardiner, $5; Dr. G. W. Clendenan, $5; Dr. S. Moore, $5; Dr. J. R. Serson, $5; Dr. W. A. Burr, $1; Dr. J. W. Wigham, $1; Dr. H. R. Holme, $5; Dr. J. M. Cotton, $25; Dr. W. A. Cerewell, $5; Dr. H. J. Hamilton, $25; Dr. R. T. Noble, $15; Dr. Mrs. Mabel B. Irish, $25; Mrs. R. A. Thomas, $10; Dr. W. A. Thomas, vaccine to the amount of $100.

An American Commission for Relief in Belgium has been formed and the treasurer, Dr. F. F. Simpson, announces that, up to January 16th, contributions to the amount of $1,414 had been received. Part of this sum has been expended upon the purchase of four hundred and fifty boxes of food at $2.20 a box and these have been forwarded to Belgium.

THE QUEBEC MEDICAL BOARD

THE chairman of the College of Physicians and Surgeons of the Province of Quebec, has issued a personal appeal to every physician of the province to use all lawful influence he may be able to command with the members of the Legislature to prevent the threatened repetition of an ancient evil, which, it was fondly hoped, had been done away with. Formerly it was an almost annual occurrence that those candidates for the licence whose primary training or professional qualifications had failed to satisfy the Board, would have a private bill passed at Quebec, with great ease and at small expense, enabling them to practise. Naturally this stultified the main function of the College; but the Board after many desperate efforts finally induced the government to refrain from withdrawing with its left hand what it had given with its right. Since the new Medical Act of 1909 no such private bill can be introduced for this purpose unless it has previously received the consent of the Board. Hence five years of peace. But during these years the unsuccessful candidates have accumulated, till now they feel that they are in such strength that, with some hope of success, they may, as the appeal puts it, "try and get a public legislation (which does not require the approval of the Board to go before the Legislature)". The situation is not without its comic side. Still it would not be wise to rely too confidently upon the Quebec Legislature's sense of humour, or of justice, and it is to be feared that the chairman is right when he insists that now is the time for the physicians of the province to take a firm stand and make their influence felt.

At its last meeting the Board of the College undertook to set its own house in better order. As the result of a plebiscite of the members, it was decided that the number of the governors should be reduced. Instead of an absurdly unwieldy and expensive Board of eighty-two, as at present, within three years the number will probably be reduced to a reasonable total of twenty-one. Possibly then it might be found practical also to reduce the annual contribution, which is now four dollars.

There is an entertaining publication entitled "Minutes" which is issued from time to time by the College to its English-speaking members. It is a strange jumble of the two languages, and might with advantage be printed entirely in the one or the other, or in both separately. The English parts abound in gallicisms, often picturesque or amusing, sometimes unintelligible. The following extract, besides mildly illustrating the point, has an intrinsic interest.

"The fact that we often proceed ourselves to these inquiries has enabled us to declare, at the meeting of July last, that we take no vacation, and to write, at about the same time, in an article, that we had spent a part of the vacation time, without specifying the length of it, outside of Montreal. The object of this remark is to remove the scruples certain magazine of medical advertising has towards the Registrar, into whose deeds it takes a really maternal interest."

One can sympathise with the doughty registrar without at first sight catching *their* meaning. One would think it an elementary rule that no translation into a foreign language should be published without having been revised by a competent person to whom that language is not foreign. These criticisms, however, are made in no spirit of Chauvinism. Indeed it is surprising how many of our French-Canadian medical *confrères*, even in the country districts, are able to express themselves fluently and extemporaneously in English, whereas it is something of a reproach to us self-satisfied Anglo-Saxons that, with rare exceptions, we can grow up in a French-speaking community without bothering to acquire a similar accomplishment.

It is announced in the *British Medical Journal* that the British Medical Association will be delighted to welcome all medical officers of the overseas contingents to make use of the library and reading rooms at 429 Strand.

It is reported that the epidemic of cerebrospinal meningitis among the Canadian troops in training on Salisbury Plain is almost over. There have been twenty-nine cases of the disease; of these twenty-five were fatal and two are incurable.

In speaking before the Royal Society of Arts on January 22nd, Sir Frederick Treves stated that since the commencement of the war there had been only two hundred and twelve cases of typhoid in the British expeditionary force, and that among these cases one hundred and seventy-three had not been inoculated; there had been but twenty-two deaths and none of these had been inoculated. No deaths had occurred amongst those who had been vaccinated.

The offer of his estate at Clevedon Taplow made by Major Waldorf Astor to the Canadian Red Cross has been accepted and the buildings have been so altered and equipped that they now form an excellent base hospital. The opening of this, the Duchess of Connaught's, hospital took place January 25th; it will be in charge of Major Gorrell, of Ottawa. The Mount Vernon Hospital, which was to have been converted into the National Research Institute, has been handed over to the Canadian Army Medical Corps.

The use of dogs in the relief of the wounded was tried in 1911 in Vincennes in the course of instruction of the sanitary service of the military government of Paris. The dogs were trained to search for the wounded, when found to take the man's *kepi*, bring it to their master, and lead him to the place where the wounded man lay. If the dog could not find the *kepi*, he would search in the man's pocket with his paw or muzzle and bring back a handkerchief or some other object. The search for wounded can be undertaken only under cover of the dark and there are many who are too weak to call out and who have to be abandoned; dogs trained for the purpose might prove of the greatest assistance to those who are searching. This was first recognized in 1885 and since then both in France and Germany a large number of dogs have been trained; in 1908 the *Société Nationale du Chien Sanitaire* was founded in France. In the present war dogs are aiding the ambulance attendants and the reports of their conduct under fire are most encouraging.

A VICIOUS circle is frequently allowed to exist because it is almost impossible to ascertain which is the weakest link or what the starting point of its pernicious existence, until perhaps a random blow at any point breaks its continuity and destroys the whole structure. This seems to have been the case regarding the public health situation in London, Ontario, which has been so much discussed during the past few weeks. The medical profession in London, as in every community, apparently counts among its number men who either through ignorance, carelessness, or pride in belonging to the "old school" do not report all cases of infectious disease. In such an event it is the duty of the medical officer to bring the matter before the Board of Health. If the medical officer is too incompetent to enforce this, or does not do so through fear of antagonizing the medical profession, it is the duty of the citizens to appoint a more competent man. But what medical officer is likely to be efficient who is secured on such a salary as is offered by the city for this official? The citizens, of course, may claim that this salary has apparently been sufficient to secure a medical officer who is considered satisfactory by the medical profession, than whom none should be more competent to judge of hygienic law and order. And so the circle is complete. There seems to be no doubt that certain medical men did not report all cases of infectious disease. There seems to be no doubt that the medical officer was not competent to fill his position. There seems to be no doubt of the unwillingness of the city council to vote the salary necessary to secure an efficient man. This state of affairs was brought to the public notice when Sir Adam Beck, as president of the London Board of Health, demanded an investigation as to who was to blame for the spread of smallpox and tuberculosis in the city. As a result the medical officer has resigned and a new Board of Health has been appointed. The fate of the city now rests on the decision of the question of who is to be the new medical officer, and it is to be hoped that the city council will not adopt a penny wise and pound foolish policy in the selection.

THE preventive measures taken have been so successful that there have been but few cases of typhoid fever or dysentery in the British army, either at home or at the front, but it has been thought necessary to establish a fever hospital for the exclusive use of the troops. The necessary arrangements were made by a committee with Bishop Boyd-Carpenter as chairman and Lord George Hamilton as treasurer, with the assistance of the Director-General of the Army Medical Service and Sir Frederick Treves. The house and grounds of Addington Park, the property of the late Mr. F. A. English, have been converted into a hospital with accommodation for one hundred and fifty acute cases, and in order to reduce the danger from convalescent carriers the hut system has been installed so that such convalescents may be kept under observation. The hospital was opened on December 13th. The medical superintendent is Dr. W. J. J. Stewart, D.P.H.; Dr. C. E. Lakin is the pathologist, Mr. T. H. C. Benians and Miss Letter, M.D., are assistant pathologists, and Mr. H. A. Williams, house physician. Sir John Broadbent and Dr. Edward C. Hort are honorary physicians, and Mr. Hugh M. Rigby and Mr. Gordon Taylor honorary surgeons.

An investigation of the Friedmann "cure" for tuberculosis was undertaken by the United States Public Health Service, and an abstract of the report of the commission was published on November 6th. The report states that twenty-five per cent. of all cases treated by Dr. Friedmann, or under his observation, subsequently developed open tuberculous lesions at the point of inoculation. This conclusion is based upon a study of ninety-four cases which were treated with the vaccine, a tuberculin made from living acid-fast bacilli. The commission reports also that the curative material employed has certain harmful properties which are particularly effective in tuberculous subjects, and that the organism used in the preparation of the vaccine has not been proved to be a tubercle bacillus at all. In summing up the evidence, the commission states, "The claim of Dr. F. F. Friedmann to have originated a specific cure for tuberculosis is not substantiated by our investigation."

An investigation of the von Ruck treatment for tuberculosis was also undertaken by the Public Health Service in response to a resolution of the United States Senate; the report of the investigation appears as Senate Document 641. An attempt was made to confirm or disprove by animal experimentation the reliability and success of Dr. von Ruck's methods in the production of immunity to tuberculosis. The investigation commenced at Asheville in Dr. von Ruck's laboratory. Since it was found to be impossible to conduct an independent investigation there, as an attempt was made to alter the entries in the laboratory record book in regard to the use of controls in some of the serum tests, the investigation was continued in the Hygienic Laboratory at Washington. Contrary to the claims of von Ruck, the vaccine was found to be unstable and subject to deterioration, and guinea pigs treated with doses recommended by von Ruck, instead of becoming immunized, exhibited increased susceptibility.

OTTAWA has not yet settled the question of its water supply. The outbreaks of typhoid fever, which have occurred in the past, are sufficient evidence of the importance of this matter, and the epidemic of 1913 is still fresh in the mind. The decision rests between two schemes—the Currie-McVeity plan of filtration of the water of the Ottawa River and the proposal to obtain the water from Thirty-One Mile Lake. The latter, which is a more expensive undertaking, meets with the approval of the provincial board of health. The legislature submitted the matter to the ratepayers, who naturally voted for the less expensive of the two proposals. The plans were prepared, at a cost of $30,000, for the Currie-McVeity scheme and were submitted to the provincial board last August. Without waiting for a reply from the provincial board, on September 14th, a meeting of the Ottawa city council was called by Mayor McVeity and the following resolution passed, eleven voting in its favour and nine against it. Resolved, "that this council protests against any reconsideration of Thirty-one Mile Lake as a source of water supply for the city; declares its unalterable determination to resist any attempt to impose the same on the ratepayers; insists upon the immediate approval of the plans for a water supply from the Ottawa River prepared by Hazen and Hipple now before the provincial board of health; and instructs the board of control to take the necessary steps for the immediate commencement of the work in order to provide employment during the coming winter." The provincial board refused to approve the plans and the matter was taken before Mr. Justice Middleton, who, on December 28th, granted an order of mandamus directing the provincial board of health to reconsider the plans and specifications prepared under the authority of Statute 4, George V., Chapter 84, for the Ottawa water supply. The board met on December 31st and unanimously rejected the plans.

Correspondence

NO. 1 GENERAL HOSPITAL

CANADIAN EXPEDITIONARY FORCE

Bulford Manor Hospital

Bulford, *December* 31, 1914.

TO THE MEMBERS OF THE CANADIAN MEDICAL ASSOCIATION:

Gentlemen,—Having the honour of being your president, I wish to avail myself of the pleasant opportunity at the end of the year, of extending to all the members my heartiest and best wishes for a Happy and Successful New Year.

My appointment to the position of officer commanding No. 1 General Hospital, of the Canadian Expeditionary Force, perhaps serves as some recognition of the Association, and nothing could have given me greater satisfaction than the opportunity of taking up the work from this point of view.

It means my absence from Canada and inability to give attention to the duties which should properly be performed by me in the interests of the Association. However, the work will be ably carried on by others.

There are one hundred and forty-two medical officers in the Canadian Contingent, many of them members of the Association, able and distinguished representatives of the profession at home, now splendid officers preparing for the front.

I am sure they cordially join me in wishing prosperity to the Association and its members.

Yours sincerely,

MURRAY MACLAREN.

TO INCREASE BRITISH TRADE

The Editor, Canadian Medical Association Journal:

Sir,—Owing to the stoppage of imports from Germany, including many commodities used by medical and scientific people, it should be impressed upon Canadians that advantage should be taken at this time to look to their future supplies from British manufacturers. Laboratory workers, especially, have been in the habit of using stains and chemicals almost exclusively of German manufacture.

As an example of what has taken place here in Great Britain regarding the looking after their own market, the British Board of Trade, in conjunction with the Committee on Chemical Manufactures, have taken such steps possible to develop the source of supply and also to encourage the permanent manufacture of dye-stuffs and colours in the United Kingdom on a large scale.

The manufacture of aniline colours rightfully belongs to Great Britain, being developed by Perkin in 1856, but the Germans outstripped us completely in a few years after the crude first colours were discovered. The dye-stuffs spoken of above apply mostly to the arts and manufactures and in this the government are assisting financially and otherwise the acquiring of works for the manufacture of these synthetic colours and there is no doubt that the British manufacturers will be able to produce the highest quality and standard shades of dyes for laboratory use. The same thing applies to chemicals and laboratory apparatus generally, and we should insist on using the products manufactured within the British Empire.

Harry Morell,
Captain, Army Medical Corps,
First Canadian Expeditionary Force,
(Pathologist, Regina General Hospital) Salisbury Plain.

A serious epidemic of smallpox has broken out in the Six Nation Indian Reserve, Brant County, Ont. It is reported that the disease has been prevalent there, in a mild form, for the past three years. The inhabitants number about 4,700 and there are at least sixty cases of smallpox.

Book Reviews

SYNOPSIS OF LABORATORY COURSES IN (I) ORGANIC AND BIOLOGICAL CHEMISTRY, (II) CHEMISTRY OF HUMAN PHYSIOLOGY, (III) CLINICAL CHEMISTRY, (IV) ADVANCED BIOLOGICAL CHEMISTRY, GIVEN AT MCGILL UNIVERSITY, MONTREAL. By R. F. RUTTAN, B.A., M.D., D.Sc., and V. J. HARDING, D.Sc., Second edition. Montreal: Renouf Publishing Company, 1914.

In this book is exposed the experience of a life-time spent in the teaching of chemistry to students of medicine, in a school, it may be added, where the study of chemistry has been extensive and profound. Every direction has been tested at the table by successive groups of students, and it would be strange if anything imperfect or unnecessary had escaped their scrutiny. The book is precisely what a text-book should be, that is, a book of texts which the student should verify and amplify for himself. The student who is under the delusion that he can learn chemistry from a book will not find much encouragement here. The student who is willing to work is provided with a sure guide. The authors have done precisely what they set out to do. They have made in small compass in a well reasoned order a complete synopsis of laboratory courses in all branches of chemistry. By following these courses the ideal student will find himself in possession of the exact amount and kind of knowledge which is necessary for the student and practitioner of medicine. It is the ideal student whom every teacher should keep in mind. We hasten to add that the ideal teacher, which each one of these authors is, does much towards making the perfect student. In this lies the success of the school from which this book emanates.

MORRIS'S HUMAN ANATOMY. A Complete Systematic Treatise by English and American Authors. Edited by C. M. JACKSON, M.S., M.D. Fifth edition, revised, largely rewritten, and illustrated. Price, $6.00 net. Philadelphia: P. Blakiston's Son & Company, 1914.

In the minds of English speaking students a text-book of anatomy always suggests the names of Grey and Morris, and a new edition of either is always an event in the academic world. Both appear with unfailing regularity, and each perpetuates its own peculiar excellency. To this edition twelve writers contribute, and each one is a prime authority upon the subject with which he deals. The volume contains 1540 pages, and yet it is not too bulky; but for the convenience of those who are interested in any one division the work is issued in five parts. Neither Sir Henry Morris nor Professor McMurrich are immediately associated with the present edition as editors, and the task of editing has fallen to Professor Jackson of the University of Minnesota. It is obviously impossible to supply an expanse of writing upon these pages at all commensurate with the importance of the subject and the book; it must suffice to say that "Morris's Anatomy" remains as one of the twin standards of anatomy in the English language.

A TEXT-BOOK OF THE DISEASES OF THE NOSE AND THROAT. By JONATHAN WRIGHT, M.D., Director of the Department of the Laboratories, New York Post-Graduate Medical School and Hospital, and HARMON SMITH, M.D., Surgeon to Throat Department of the Manhattan Eye, Ear, Nose and Throat Hospital; Clinical Professor of Laryngology and Rhinology, Cornell University Medical School. Octavo, 683 pages, with 313 engravings and 14 plates. Cloth, $5.00 net. Lea & Febiger, publishers; Philadelphia and New York, 1914.

In the superscription we have set forth at some length the titular place which is occupied by these two writers for the benefit of those who are not yet familiar with the work they have done in the field of laryngology, although many readers will remember Professor Wright's "History of Laryngology and Rhinology," which was issued by the same publishers about a year ago. The present book is a scientific and scholarly one. It deals not alone with the conditions as they are observed clinically; it aims to present a theory of the production of those conditions, and to state serially the causes which brought them into being. Their work originated in the laboratory, and the abnormal is always considered in relation to the normal. For that reason we say the book is scientific. It is scholarly because the subject is presented as a whole with all the parts in due perspective. From this it is not to be inferred that the book is doctrinaire. On the contrary, every process of reasoning is brought to the test of experience, and few surgeons in this special field have had a wider or more varied experience. The book is one for the student, for the general as well as for the special practitioner. No higher praise than this could be given.

Practical Therapeutics. By Hobart Amory Hare, M.D., B.Sc., Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College of Philadelphia. New (15th) edition, thoroughly revised and rewritten. Octavo, 998 pages, with 144 engravings and 7 plates. Cloth, $4.00 net. Lea & Febiger, publishers, Philadelphia and New York, 1914.

The appearance of a new edition of "Hare's Therapeutics" is reminiscent of one's youth, even although that youth lies far backward in the abysm of time, for the one now offered by Messrs. Lee and Febiger is the fifteenth. Much has happened in life and in medicine since the first edition was issued, but of the progress in medicine, at least, these successive volumes have given a faithful account. So long as physicians administer drugs, and desire to administer them intelligently, a book upon therapeutics will be a necessity, and no book fills that need more completely than this last of a long series.

Pathogenic Microörganisms. By William H. Park, M.D., Professor of Bacteriology and Hygiene in the University and Bellevue Hospital Medical College, and Director of the Bureau of Laboratories of the Department of Health, New York, and Anna W. Williams, M.D., Assistant Director of the Bureau of Laboratories, New York City; Consulting Pathologist to the New York Infirmary for Women and Children. New (5th) edition, thoroughly revised. Octavo, 684 pages, with 210 illustrations and 9 full page plates. Cloth, $4.00 net. Lea & Febiger, publishers, Philadelphia and New York, 1914.

Few persons are unfamiliar with Professor Park's text-books on bacteriology. He was one of the first in the field as a worker and a writer, and it must now be many years since his "Bacteriology in Medicine and Surgery" was issued. The book under consideration is the outcome of lesser and more specific books, and in it is set forth all that is known of the microörganisms which produce disease. Of late years the technique of the subject has become highly complicated, and it has fallen into the hands of specialists, but the principles are still the same. Professor Park always had the capacity for enunciating those principles, and he still keeps them simple in the newer and more complex environment. In the compass of a small volume everything really essential in the new science of bacteriology finds expression.

International Clinics. Edited by Henry W. Cattell, A.M., M.D., and others. Volume III and Volume IV, Twenty-fourth series, 1914. Philadelphia and London: J. B. Lippincott Company, Montreal: Chas. Roberts.

We hasten to call attention to the fourth volume for the year of International Clinics, which arrived on December 28th. Even a cursory examination convinces one that this volume is of the high standard of the previous ones, and completes the series for the year with distinction. Coming from so many hands the various articles maintain a high degree of excellence.

The Salvarsan Treatment of Syphilis in Private Practice With Some Account of the Modern Methods of Diagnosis. By George Stopford Taylor, M.D., M.R.C.S., and R. W. Mackenna, M.A., M.D., B.Ch. Price $1.50. New York: Rebman Company. Toronto: McAinsh & Company, Limited.

Any one of Messrs. Rebman's books creates an immediate interest in the mind of a reviewer. They are usually small, always definite in their aim, and the subject of immediate importance. The theme of this book is praise of salvarsan. From the evidence submitted that praise would appear to be justified, and the evidence is quite clearly displayed on these pages.

The Diagnostics and Treatment of Tropical Diseases. By E. R. Stitt, A.B., Ph.G., M.D. Illustrated. Price $2.00 net. Philadelphia: P. Blakiston's Son & Company, 1914.

Every known disease peculiar to persons living in the tropics receives mention in this little book. The descriptions of each disease is succinct and clear. The causes, where known, are fully explained, and in cases where the cause has not yet been discovered the various surmises are adequately stated. Dr. Stitt has done for tropical medicine what Frederic Taylor, for example, did so long ago for general medicine; that is, he has prepared a valuable summary of existing knowledge.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

LOCAL AND REGIONAL ANASTHESIA, INCLUDING ANALGESIA. By CARROLL W. ALLEN, M.D., with introduction by RUDOLPH MATAS, M.D. Price, cloth, $6.00 net; half morocco, $7.50 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

THE CANCER PROBLEM. By WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D. New York: The Macmillan Company, 1914. Toronto: The Macmillan Company of Canada, Limited.

INTERNATIONAL CLINICS. Edited by HENRY W. CATTELL, A.M., M.D., and others. Volume III. Twenty-fourth series, 1914. Philadelphia and London: J. B. Lippincott Company. Montreal: Chas. Roberts.

MEDICAL JURISPRUDENCE. A statement of the Law of Forensic Medicine. By ELMER D. BROTHERS, B.S., LL.B. Price $3.00. St. Louis: C. V. Mosby Company, 1914.

THE TONSILS, FAUCIAL, LINGUAL, AND PHARYNGEAL WITH SOME ACCOUNT OF THE POSTERIOR AND LATERAL PHARYNGEAL NODULES. By HARRY A. BARNES, M.D. Illustrated. Price $3.00. St. Louis: C. V. Mosby Company, 1914.

PATHOGENIC MICROÖRGANISMS. (Including Bacteria and Protozoa.) By WILLIAM H. PARK, M.D., and ANNA W. WILLIAMS, M.D. Fifth edition, thoroughly revised. Price, cloth, $4.00 net. Philadelphia and New York: Lea & Febiger, 1914.

THE PSYCHIC UPLIFT, OR THE NEW MIND CURE. By MAZETTA LAIRY. Price $2.50. London: B. F. Stevens & Brown.

THE DIAGNOSTICS AND TREATMENT OF TROPICAL DISEASES. By E. R. STITT, A.B., PH.G., M.D. Illustrated. Price, $2.00 net. Philadelphia: P. Blakiston's Son & Company, 1914.

THE BACKWARD BABY. A TREATISE ON IDIOCY AND THE ALLIED MENTAL DEFICIENCIES IN INFANCY AND EARLY CHILDHOOD. By HERMAN B. SHEFFIELD, M.D. Illustrated. Price $1.00. New York: Rebman Company. Toronto: McAinsh & Company, Limited.

THE SALVARSAN TREATMENT OF SYPHILIS IN PRIVATE PRACTICE WITH SOME ACCOUNT OF THE MODERN METHODS OF DIAGNOSIS. By GEORGE STOPFORD-TAYLOR, M.D., M.R.C.S., and R. W. MACKENNA, M.A., M.D., B.CH. Price $1.50. New York, Rebman Company. Toronto: McAinsh & Company, Limited.

THE POCKET FORMULARY FOR THE TREATMENT OF DISEASE IN CHILDREN. By LUDWIG FREYBERGER, J.P., M.D., M.R.C.P., M.R.C.S. Fourth, revised, and enlarged edition adapted to the British Pharmacopœia, with an appendix on poisons, their symptoms and treatment. Price $2.00. New York: Rebman Company. Toronto: McAinsh & Company, Limited.

SYNOPSIS OF LABORATORY COURSES IN (I) ORGANIC AND BIOLOGICAL CHEMISTRY, (II) CHEMISTRY OF HUMAN PHYSIOLOGY, (III) CLINICAL CHEMISTRY, (IV) ADVANCED BIOLOGICAL CHEMISTRY, GIVEN AT MCGILL UNIVERSITY, MONTREAL. By R. F. RUTTAN, B.A., M.D., D.Sc., and V. J. HARDING, D.Sc. Second edition. Montreal: Renouf Publishing Company, 1914.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE, VOLUME VII., NO. 9, JULY, 1914. Price 7s 6d net. London, New York, Calcutta, Bombay: Longmans, Green, and Company.

PROGRESSIVE MEDICINE, VOLUME XVI., NO. 4, DECEMBER 1ST, 1914. Price $6.00 per annum, published quarterly. Philadelphia and New York: Lea & Febiger.

MEDICAL NURSING. By A. S. WOODWARK, M.D., B.S., M.R.C.P. Price 4s 6d net. London: Edward Arnold, 1914.

CHEMISTRY FOR NURSES. By REUBEN OTTENBERG, A.M., M.D. New York: The Macmillan Company, 1914. Toronto: The Macmillan Company of Canada, Limited.

OBITER SCRIPTA. THROAT, NOSE, AND EAR. By A. R. FRIEL, M.A., M.D., Bristol: John Wright & Sons, Limited, 1914.

TEXT-BOOK OF ANATOMY AND PHYSIOLOGY FOR NURSES. Compiled by DIANA CLIFFORD KIMBER. Fourth edition, revised with additions and illustrations by CAROLYN E. GRAY, R.N. New York: The Macmillan Company, 1914. Toronto: The Macmillan Company of Canada, Limited.

MORRIS'S HUMAN ANATOMY. A COMPLETE SYSTEMATIC TREATISE BY ENGLISH AND AMERICAN AUTHORS. Edited by C. M. JACKSON, M.S., M.D. Fifth edition, revised, largely rewritten, and illustrated. Price $6.00 net. Philadelphia: P. Blakiston's Son & Company, 1914.

A TEXT-BOOK OF DISEASES OF THE NOSE AND THROAT. By D. BRADEN KYLE, M.D. Fifth edition, illustrated. Price $4.50 net. Philadelphia and London: W. B. Saunders Company, 1914.

SURGICAL MATERIALS AND THEIR USES. By ALEXANDER MACLENNAN, M.B., C.M. Illustrated. Price 4s 6d net. London: Edward Arnold, 1915.

DIFFERENTIAL DIAGNOSIS. VOLUME II. PRESENTED THROUGH AN ANALYSIS OF 317 CASES. By RICHARD C. CABOT, M.D. Price, cloth, $5.50; half morocco, $7.00. Philadelphia and London: W. B. Saunders Company, 1914.

PASTEUR AND AFTER PASTEUR. By STEPHEN PAGET, F.R.C.S. London: Adam and Charles Black, 1914. Toronto: The Macmillan Company of Canada, Limited.

Obituary

Dr. Alton H. Garratt, of Toronto, died December 31st, in the fiftieth year of his age. Dr. Garratt was born on a farm near Wellington, Ontario. He graduated from Trinity University in 1888 and in the same year went into practice at Queensborough; the following year he removed to Toronto. Dr. Garratt was a fellow of the College of Physicians and Surgeons and was attached to the staffs of the General and St. Michael's hospitals. He leaves a widow and one son.

Dr. Tamlyn, of Wingham, died December 20th, in the eighty-second year of his age. Dr. Tamlyn was born in England and came to Canada when he was ten years of age. He graduated from Trinity College, Toronto, in 1859, and forty-eight years ago commenced to practise at Wingham. He leaves one son, Dr. W. H. Tamlyn.

Dr. Albert Edward Bolton, of Vancouver, died December 26th. Dr. Bolton, who was born in Newboro', Ontario, in 1862, was a graduate of Queen's University. He opened the first medical mission at Port Simpson, where he laboured for thirteen years. For the past twelve years he had been in private practice at Victoria and at Vancouver.

Dr. Nelson McGarvin died at Berlin, Ontario, on Christmas day. Dr. McGarvin was eighty-five years of age; he was born near Dundas, Ontario. He practised at Acton, Georgetown and Markham in Ontario, and then for twenty-four years at Butte City, Montana. He retired three years ago.

Dr. Crawford Johnston died at Havre, Montana, on November 14th, at the age of twenty-eight years. Born at Alma, Ontario, in 1886, Dr. Johnston graduated from the University of Toronto and subsequently went into practice at Upham, North Dakota. Since 1907 he had been practising at Cuthbertson, Montana. He leaves a widow and infant daughter.

Dr. Dietrich A. Drummond, of St. Stephen, New Brunswick, died suddenly from heart disease on January 1st. Dr. Drummond, who was in the fortieth year of his age, graduated in medicine from the Northwestern University and commenced to practise in Chicago. His health having failed, a few years ago he went to St. Stephen to recuperate. He regained his health to some extent, applied for registration in the province of New Brunswick, and went into practice at St. Stephen.

Dr. A. E. Schultz died at Elmira, Ontario, on Wednesday, December 23rd. Dr. Schultz formerly practised at Elmira but for a year or more had been in practice in Northern Ontario. He leaves a widow and daughter.

Dr. Gerald Devell, of Souris, Manitoba, recently died at Millbrook, Ontario.

Dr. W. H. Desjardins, of Montreal, died January 9th. Dr. Desjardins was born at Terrebonne, Quebec, in 1848. He studied at the Masson College and, at the age of eighteen, enlisted in the Papal Zouaves and saw active service at the battle of Castlefidarelo. He studied at the University of Rome, and on his return to Montreal, at the old Victoria University, at which he later became a professor. Dr. Desjardins was a brother of the late Honorable Alphonse Desjardins; he practised in Boston, Massachusetts, for ten years and was president of the Boston Medical School.

Dr. Charles H. L. Johnston, of St. John, New Brunswick, died suddenly from heart failure on January 18th. Dr. Johnston was seventy-one years of age; he had practised in St. John since 1865. He was the son of the Honourable John Johnston and was a graduate of Edinburgh University.

Dr. George O'Donnel Walton, of Barbadoes, died recently in the seventy-second year of his age. Dr. Walton graduated from McGill University in 1873. He practised for forty years in Barbadoes. He is survived by four sons.

News

MARITIME PROVINCES

The St. Joseph's Hospital at Glace Bay has been placed in charge of the Sisters of St. Martha. The change has been made in the interests of economy and because of the financial situation.

ONTARIO

Dr. T. E. Kaiser, of Oshawa, was recently appointed honorary major in the Canadian militia. The appointment was made as a mark of appreciation for services rendered in connexion with the building of the Oshawa armoury and assistance in the collection of troops and in connexion with the Patriotic fund.

On account of the prevalence of smallpox in the city of Brantford, the board of health is enforcing public vaccination as provided in the vaccination act. Most of the cases are of a mild type.

The schools of St. Thomas were reopened on Monday, January 11th. During the outbreak of diphtheria sixty-eight cases were reported and four deaths occurred. The population of St. Thomas is about 16,000, so that during the recent epidemic there were 4·9 cases of diphtheria per thousand of population. Forty-two of the cases came from the Balaclava district.

An address was delivered to the Toronto Academy of Medicine by Dr. Brown-Landone on January 15th. Dr. Brown-Landone spoke of the difficulty of transporting the wounded and the lack of medical and surgical supplies in the north of France. At the close of the meeting a committee was formed, composed of a member of each hospital staff; this committee will collect supplies and forward them to Havre.

Typhoid fever is reported to be prevalent in Brockville.

On December 22nd, last, it was reported that in the village of Madoc there were over thirty cases of smallpox. The disease has been prevalent there for some weeks.

A WARD containing twenty beds is to be added to the fever hospital at Lanark. The cost is estimated at two thousand dollars.

AN outbreak of diphtheria at Windsor has made it clear that some provision must be made for epidemics of contagious disease and it is now proposed to erect four buildings, one for the treatment of cases of diphtheria, one for smallpox, one for scarlet fever, and one for administrative purposes.

AT a meeting of the Galt hospital board, held January 20th, it was resolved that the city council should be requested to submit a bylaw for $15,000 to the ratepayers to enable the board to pay off a deficit amounting to that sum.

Dr. T. M. FLOCK has been appointed medical superintendent of the Essex County Tuberculosis Hospital. Dr. Flock has worked for some time at the Hamilton Sanatorium in association with Dr. Holbrook.

THE Peterborough Health Association has completed its third year of activity. Two nurses were employed during the past year and between them they visited 206 patients, making 3,350 calls. A summer camp for children was organized in July and was carried on successfully for six weeks. As its continuance depended upon voluntary subscription, the depression consequent upon the outbreak of the war made it necessary to close the camp. There were between thirty and forty children on the register.

SINCE the Queen Alexandra Sanatorium, at London, was first opened in April, 1910, 325 patients have been admitted and 14 deaths have occurred. On December 17th, last, there were in residence 56 patients.

QUEBEC

THE number of patients in the Montreal hospitals just now is unusually large. This is due chiefly to financial conditions, for many people who in better times went to private physicians now go to the less expensive hospitals. The following list gives the number of patients in the principal hospitals of Montreal at the time of writing: Montreal General, 401; Royal Victoria, 307; Western, 83; Notre Dame, 150; Hotel Dieu, 251.

As is pointed out in the Montreal *Sanitary Bulletin*, the cases of contagious disease in the Montreal schools decreased very materially during the year 1914 as the following comparison will show: In 1913 there were 38 cases of diphtheria; in 1914 only 12; of scarlet fever there were 64 cases in 1913, and 34 in 1914; of measles 233 cases in 1913 and 2 in 1914; of varicella 190 in 1913, and 118 in 1914. The decrease no doubt is due in large measure to the regular inspection of the children.

EARLY in January it was reported that two hundred cases of typhoid fever had occurred in Hull and that, within a space of eight days, five deaths had been caused by the disease. It is thought that the water supply is the cause of the epidemic. An outbreak of smallpox is reported from Huntingdon.

A DEPUTATION from the Laurentian Society for the Treatment and Control of Tuberculosis waited on the provincial government on December 14th, last, with the request that the province should grant the sum of three dollars a week for each bed in every charitable institution that devotes itself, partially or wholly, to the support and care of patients suffering from tuberculosis within its boundaries. Dr. Kinghorn outlined the history of the Laurentian Society from the time the sanatorium at Ste. Agathe des Monts was started in 1908. The request was received with consideration but Sir Lomer Gouin reminded the deputation of the great financial difficulties of the present time.

ALBERTA

DURING the past year 1,511 patients were treated in the Medicine Hat General Hospital; there were 27,470 hospital days; 227 births and 56 deaths occurred. There was a noticeable decrease in the number of typhoid patients. The cost of maintenance was $1.41 per head per day. The proposal to build a new hospital has been abandoned for the present.

SASKATCHEWAN

THE annual meeting of the College of Physicians and Surgeons of Saskatchewan took place at Regina on Tuesday, December 28th. The annual report of the college was presented and the financial report was discussed and held over for consideration at a future meeting. Of the forty candidates who have been licensed to practise in the province, six have taken advantage of Dominion Registration. Dr. Argue, of Grenfell, retired from the presidency, and his successor was appointed in the person of Dr. H. Eaglesham, of Weyburn. Dr. Irving of Yorkton was elected vice-president, and Dr. Charlton was re-appointed registrar. Dr. Young of Saskatoon was elected to the executive, and is also chairman of the finance committee.

The ratepayers of Weyburn have voted $30,000 to complete and equip the hospital.

BRITISH COLUMBIA

Dr. W. H. Jakeman, V.M.D., has been appointed official bacteriologist for the city of New Westminster, in succession to Dr. Wittich who has resigned.

The formal opening of the new administrative building and nurses' home of the Vancouver General Hospital took place on January 1st. These buildings, with their equipment, have cost $250,000.

MEDICAL COLLEGES

Alberta University

The provincial laboratory is now in the bacteriological department of the University of Alberta. It has undertaken the preparation of anti-typhoid vaccine for the inoculation of Alberta men prepared to go to the front. Later on, other vaccines will be prepared in the laboratory.

The University has been admitted to affiliation with the University of Oxford. This means that a student who has completed his course at the University of Alberta may study at Oxford without further examination.

Dr. Gordon Gray has been appointed senior demonstrator in physiology, Mr. William Hale as demonstrator in pharmacy, and Dr. L. C. Conn as demonstrator in anatomy in the faculty of medicine.

Queen's University

The Faculty of Medicine of Queen's University has offered to provide the personnel of a General Hospital for service at the front.

Toronto University

Dr. Andrew Hunter has been appointed to the chair of chemical pathology, in succession to Professor John B. Leathes, who recently accepted an appointment at the University of Sheffield.

One thousand eight hundred men are now enrolled in the Officers' Training Corps of Toronto University. The medical faculty has supplied 450, science, 500; University College, 360; Victoria, 200; the dental faculty, 160; Wycliffe, 40; faculty of education, 80; Trinity, 60, and St. Michael's, 40. One hundred men from McMaster University are also enrolled. Twenty members of the staff of the University of Toronto are acting as officers in the training corps, and fifty-five as privates in the ranks. The training is under the direction of Colonel Lang. In order to instruct public opinion, a course of lectures on the war was given recently.

Forty-nine members of the graduating class in medicine were released from academic duties for two weeks at the commencement of last month in order that they might attend a provisional school of instruction organized by the Army Medical Corps. Upon receiving their certificates as officers, they will be eligible for subalterns' certificates in the medical corps.

ARMY MEDICAL SERVICES

The B section of the Canadian Army Medical Corps, which will form part of the second contingent, left Victoria on Saturday, January 16th, on its way to Winnipeg. The section is in charge of Captain Anderson and includes eighty-one men, for the most part recruited in Vancouver and Vancouver Island. The section will join two other sections at Winnipeg and together they will form a field ambulance brigade. The men have been carefully chosen and they all possess a thorough knowledge of first aid and ambulance work.

Dr. George H. Wilson, of London, Ontario, has been appointed medical officer of the Seventh Regiment Canadian Mounted Rifles.

Dr. R. J. McEwen, of Saskatoon, has been given the rank of captain and has left for England, on his way to join the Princess Patricia's Canadian Light Infantry at the front. Dr. Andrew Croll has succeeded Dr. McEwen as medical examiner of troops at Saskatoon.

Dr. George C. Hale, of London, Ontario, has been commissioned as medical officer of the Eighteenth Battalion for overseas service with the second contingent and has been assigned to duty as medical officer at Queen's Park encampment in succession to Major Archibald V. Becher, of London, who has been appointed medical officer of the Thirty-third Battalion.

The following doctors who took the qualifying course in Montreal in November were granted certificates as lieutenants, Army Medical Corps, December 28th: S. M. Asselstine, Kingston; E. W. Archibald, F. B. Gurd, W. W. Francis, L. J. A. Mignault, J. McCombe, W. H. Smyth, G. Fisk, L. L. Reford, C. C. Birchard, C. R. Bourne, T. P. Shaw, T. F. Cotton, A. R. Pennoyer, C. W Vipond, D. W. McKechnie, W. G. Turner, J. G. Adami, J. L. Todd, D. A. Hingston, J. G. Browne, H. C. Burgess, W. Bourne, J. T. Rogers, S. G. Ross, A. B. Walter, H. C. Dixon, H. W. E. Lockhart, G. A. Trenholme, L. H. McKim, J. A. MacMillan, A. H. Gordan, E. J. Mullally, H. P. Wright, R. H. M. Hardisty, C. F. Moffatt, T. A. Starkey, C. K. Russel, J. C. Meakins, H. M. Little, J. C. Wickham, W. H. Jamieson, Montreal.

Dr. Percy E. Doolittle, of Toronto, has been appointed chief commandant of the war automobile organization.

The following doctors will sail from Halifax on the 7th inst. for hospital service with the first contingent; seventy-five nurses and about one hundred orderlies will leave at the same time. Captain J. P. Walsh, Quebec; Lieutenant Keith Dean, Winnipeg; Lieutenant R. M. Linton, London; Lieutenant A. L. Jones, Victoria; Lieutenant M. V. Valiquette, Ottawa; Captain A. R. Selby, Calgary; and Captain Lozier, New Brunswick.

THE WAR

Hospital Experiences in France*

Malo-les-Bains, *December* 16th, 1914

DEAR SIR WILLIAM: It is nearly a month now since I promised to send you notes of our work here with the Friends' Ambulance Unit. Part of what I shall have to say happened before my arrival, but it is all of the same story.

The feelings of the Society of Friends as a body towards war is well known and soon after the present trouble began a group of sixty to seventy young men, chiefly Quakers, determined to train themselves for service as an ambulance unit. To Mr. P. J. Baker, a young Cambridge graduate, a good scholar and splendid athlete, and now vice-principal of Ruskin College, Oxford, must be given the credit of organizing the training camp at Jordans in Buckinghamshire (not far from the grave of William Penn). Here for about six weeks these young fellows, many of them Cambridge and Oxford undergraduates, worked hard in learning stretcher drill, first aid dressings, etc. Fortunately, ample financial support was provided, and when they volunteered as a unit to the British Red Cross for work in France, as their plans for Serbia were found impossible, their offer was quickly accepted, and they were sent out as the First Anglo-Belgian Ambulance Corps. Surgeons as well as dressers (medical undergrads) had in the meantime added themselves to the party and with a dozen and more ambulance and transport cars, an independent unit, complete in itself, was thus formed.

They came to Dunkirk and established themselves at Malo-les-Bains just outside the northern ramparts of the town. The very evening of their arrival they started work at the Dunkirk railway sheds, where French and Belgian ambulance trains kept arriving at all times of the night and day. They worked as hard as niggers, in four-hour shifts, in the face of all manner of difficulties. There were no cots in those days as there are now, and the poor wounded had to be content with a layer of straw on the floor. The Friends found few there to help them and sometimes as many as two thousand would arrive in one night. The overcrowding, the want of proper artificial light, and the terrible stench of infected wounds combined to make their task anything but a light one. Literally they had to sift the dead from the wounded. Proper organization of the authorities was lacking at that time, but the unit undertook this herculean labour and did splendidly efficient work in dressing wounds, in doing amputations and in helping reëntrain the wounded. Such work could not go unrecognized, and they were then asked by the French authorities to establish a hospital at Dunkirk. In the meantime surgeons, dressers, and orderlies were sent out to the front with ambulances, to Ypres and other places. These parties took turn about for two weeks, doing first-aid work, necessary operations, and helping in evacuating the wounded from field hospitals. There has been no display, they have worked quietly and have been "boomed" by no London dailies, but they have won the confidence of the French "Santé Militaire". Lately they have had a hospital at Ypres of about thirty beds, filled with wounded civilians and feeble seniles, in an asylum, but the other day the place was shelled, as French troops encamped near-by. There were some narrow escapes, but now these poor patients are safe in the Queen of the Belgians Hospital. I came out just three days after the Friends' Hospital was opened, and have been allowed to work for the unit whilst waiting for the Queen of the Belgians Hospital to be put in readiness.

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* I am sure your readers will appreciate this excellent picture of the conditions in North-Eastern France.—William Osler.

Malo-les-Bains has always been a gay place in summer, but one could not imagine that there was much excitement during the winter. However, the war has changed everything; soldiers are everywhere, Algerian troops on their little Arab horses ride along the sands, ambulances and transports rush about and aeroplanes are a daily sight. So far we have only seen one hostile machine, but before my arrival a bomb was dropped on Dunkirk. The Royal Naval Air Service motors are here in great numbers. Commander Sampson (who has struck such terror into German hearts that they would now crucify him) is seen starting out in his armed motor car, and with his Japanese scout on a motor bicycle ahead. To return to more peaceful things, there are, needless to say, many restaurants and summer hotels in Malo which are occupied by Red Cross people or have been turned into hospitals. The Casino is a large French convalescent home for soldiers. The Friends are quartered in the Hôtel Kursaal, facing on a large square. The establishment is complete and from the commanding officer, Baker, down, each one has his daily duties. We have our own cook, the "butler" is a well-known English athletic trainer and celebrated starter, and what a character he is, too! There is an adjutant and several assistant adjutants who have offices and issue daily orders which are posted up in several places. In the large dining-room below orderlies are appointed for the day, who set the tables, etc., and what an excellent dish-washer our futurist painter makes! The officers of the unit and the surgeons have their meals in the "mess" upstairs. It is a very congenial crowd that gathers about the table at tea or dinner time. Often we have visitors at the former meal—sometimes officers from England inspecting us and on other occasions, very interesting men. Lately we had, at different times, two well-known war correspondents, George Lynch and Mr. Nevinson, and during this week Mr. Norman Angell, author of "The Great Illusion," has honoured us several times. If the staff surgeon of the small Naval Hospital here turns up we do our best to learn some British secrets, but these naval fellows are generally men of few words. Chauffeurs are daily appointed for ambulance duty or to take a car down to the quay in Dunkirk where the Admiralty boat comes in with stores. Then two hours a day are expended in instruction for would-be motor-car drivers. A canteen has quite recently been started in the Kursaal which is open for the sale of tobacco, cigarettes and chocolate. It is open for half an hour after each meal, and a lending library is run in connexion with it. Everything is carried out on military lines, and even our letters are censored.

Stretching along the seashore from Dunkirk harbour pier for a distance of about a mile and a half is the paved promenade or *digue*, and on this are the Casino and the villas. In one of these, "Villa St. Pierre," the Friends' Hospital is established. It is a high, narrow house, but we are able to accommodate fifty beds and to provide for an operating room, store rooms, dispensary and ample kitchen space. One of the wards, which is a bright room with many large windows looking out towards the sea, is at the front of the house, and holds ten beds for wounded and there is another ward for twelve beds. It is written that we should have seventy per cent. of sick (but are not supposed to have typhoid) and the rest of wounded cases. The former are stowed away in the rooms upstairs with two to five beds in a room. Luckily the weather has not been too cold and sufficient heat is given out by a few oil stoves. The French love for mirrors is much in evidence and the patients cannot but see enough of themselves. There is a very capable housekeeper and a splendid matron in charge and eight nurses who have had their training in the large London or Scottish hospitals. Dr. Nucholds is chief surgeon, and there are five others, though two or three of these are always out at the dressing stations at the front. Then we have a Harley Street anæsthetist. Each surgeon has his dresser, and there are besides a general orderly, nursing orderlies, storekeeper, dispenser, and so on. We are directly under French supervision, and a daily report of the number of cases in the hospital and the number to be evacuated has to be sent in. Practically all the cases are French soldiers, though we have had an occasional Belgian. In four weeks one hundred and twenty-two cases were admitted and so far we have only had four deaths, two bad head injuries with meningitis, one of typhoid, and one death after operation on a case of typhoid perforation. Everything was quickly organized, the patients are happy and they are better fed than we are. The French military surgeons seem very pleased.

Before my arrival the medical staff of the hospital was complete, but the Friends have been very kind, so it has fallen to my lot to work at the railway sheds in Dunkirk, or at the "shambles," as we call them, every night. Accompanied by a dresser and orderly I start in the ambulance for Dunkirk at about a quarter to nine. The sentries know us at the ramparts and "Croix Rouge anglaise" does for the pass-word. We pass along the quay and follow the car line beneath the tower of the church of St. Cloi, where the old buccaneer, Jean Bart, is buried, and thence across the lock to the station. Those who were here at first say that a tremendous change for the better has been worked in the conditions at these railway sheds. It was largely through the efforts of an Englishwoman, Lady Decies, that iron cots, to the number of over four hundred, were installed in one of the two large sheds. As a consequence, few soldiers lie in the straw except on crowded nights. Also arc lights have been put in, but if we attempt to dress a wound in the flank of a patient on the lee side of the light it is still a difficult matter to see properly. Also, French carbons seem to have a delightful habit of burning up quickly, so we make good use of electric torches. There are small rooms boarded off at the end of both sheds and here the French surgeons dress the more serious cases and inject antitetanus serum, if that has not already been done.

In the French army medical system immediately behind the trenches there are *postes de secours* for first-aid work, and behind these again, *dépots des écloppés* where those with slight injuries may remain before going back to the fighting line. At a greater distance there is an evacuation hospital where necessary operations are performed, and in this district trains convey sick and wounded to the town of Dunkirk. Our sheds are technically known as the *gare d'évacuation.* French and Belgian ambulance trains keep arriving at all times of the day and night. However, their time of coming seems always to be more or less uncertain, and if we ask the French *médecin-en-chef* if he expects a train, he almost invariably replies, with a gesture of despair, "*nous attendons un train, mais a quelle heure*"! These trains are well fitted up and there are numerous attendants on board, and occasionally a priest. Nearly all the wounded and sick are taken from the trains by *brancardiers*, or stretcher-bearers, and are laid out on the cots—the less serious cases going to the shed on the other side of the tracks. The *médecin-en-chef* for the evening (they seem to change very often) then goes around to everyone, noting the nature of the wound or the diagnosis which is written on the card attached to the soldier's button-hole, and he decides if the case is to be sent to one of the French or English hospitals in Dunkirk, or whether he is to be put on to the train again or conveyed to one of the hospital ships lying in or just outside the harbour. When those put on to the train will reach a hospital, nobody seems to know—this wholesale shipping is a survival of days when the capture of Dunkirk by the enemy seemed imminent—and some cases are on the train for days, and some reach the south of France, perhaps Marseilles. Be it understood that these are the lighter cases, but dressing of the wounds cannot be very properly carried out on board. This part of the system really needs reform.

It is very interesting to stand with the *médecin-de-service* in the shed where the less severe cases are sent. They walk, hobble, or are carried past, each one is looked at more or less thoroughly, his card scrutinized, questions are asked, an occasional war story is listened to, and the cases are classified. The sergeant of the *brancardiers* stands beside us and, instructed by the surgeon, gives each soldier a slip of paper with the class which he is put into upon it. Here by far the most are suffering from "*pieds gelés*," have a "boil," have sprained their ankles or are suffering from some very minor complaint, and all these men are termed *éclоppés*. They are put on to the trains again or sent to rest in the Casino at Malo-les-Bains. Then there is the large body of poor fellows, who have some fever, headache, with or without diarrhœa, insomnia, and so on. If the case is definitely typhoid (perhaps we see on his card that the Widal is positive), he is sent to the fever hospital in Dunkirk or Rosendael; but before this he lies for a time in the straw amongst the *contagieux.* The more indefinite ones are called *suspects*, and are kept by themselves in another class. I am glad to hear it said that many of these soon get well. We are not allowed to admit typhoid cases, so if we see *embarras gastrique fébrile, bronchite avec la diarrhée*, or *courbature fébrile* written on the soldier's card, or *fiche*, we steer clear of that case. Amongst the *malades* there are numerous cases of bronchitis of longer or shorter duration, and generally in the men over forty. Often the French doctors put a towel against the man's back (greatcoat and all beneath) and the râles are easily heard, and I have found that sometimes, by palpating, these râles may be felt through all the soldier's garments. One sees cases of articular rheumatism, but more of them suffer from a milder form of arthritis. I have seen two or three cases of broncho-pneumonia, three or four of pleurisy, one case of jaundice, several cases of "pink eye," and so far only one case of nephritis. There is a further division of the *malades*, those suffering from *gale* (the itch), and venereal cases lie in separate groups in the straw.

The sick and wounded are practically all French (including Algerians) and Belgian soldiers, and lately many French marines. But one night we discovered three British "Tommies." We pounced on them and took them to the hospital, we were so glad to see them. We put all kinds of questions to these men and, needless to say, the Irishman among them was readiest with his tongue and acted as spokesman for the group. As a whole the wounded are very brave fellows during the painful dressing of their wounds, and are generally in good spirits. Only the other night one soldier exultingly told me how their company had captured a hundred and fifty "*Boches*". You can hardly imagine how muddy some of the men are. They nearly all carry a *sac*, but the Zouave always has a "hold-all" at hand, and I have seen more than one fellow produce a huge piece of bread from his capacious pantaloons. How long it had been knocking about his knees he alone can tell! Some of the French troops of course cannot speak French, and an Arabian interpreter is necessary, but they all know the word "*Boches*," and with signs and gestures we are left in no uncertainty as to what these Africans would do should any Germans chance to fall into their hands. Very often we see German prisoners marching under guard along to another building. They do march well and it is fine to see them still holding their heads in the air. There are a few wounded Germans. The French *brancardier* used to look on them as a sort of wild animal to stare at and seemed jealous, rather, if we went up and spoke to these poor fellows. They thought perhaps we were wont to bestow more attention on the "*Boches*" than on the soldiers of their own race. However, this feeling towards the wounded of the enemy has happily changed to some extent. Some of these Germans seem rather glad that they have been taken captives, and more than one has told me that he thought the war was not necessary and that they were not volunteers but had to fight.

Among the workers at the "shambles" there are always plenty of French medical men who have been called to military service. The executive head remains the same but the junior officers are on duty there by rotation. Dr. Monod, of Vichy, who was in Montreal last spring and read a paper before the Medico-Chirurgical Society, appears every third or fourth night. He has the distinction of being the only one, or one of the very few, of the French medical men who has the M.R.C.P. degree. It is a pleasure, too, to meet one who speaks English so fluently. To-day he and some others are leaving to do ambulance duty somewhere in Belgium. Lately the daughter of the president of the French Red Cross with another French nurse have been at work every night. Great credit must be given to the English nurses who have come over as volunteers and who labour at the sheds till after midnight. There seem so few trained French nurses. One or two British doctors are there every night and we only dress the cases which have not been dressed during the previous twenty-four hours, and only touch the cases which are going back on to the trains, for, of course, any treatment can be carried out in the French or British hospitals to which they are going. There are exceptions; for hæmorrhage, arteries have occasionally to be tied, and I might remark that I have only seen two die of such hæmorrhage.

It seems to be a difficult matter to transport the wounded from the front, and though some we see were wounded only twelve to twenty-four hours before, many have been two to three days on the road, a distance of thirty or forty miles. Most of the cases report that they were wounded near Nieuport, Dixmude, or Ypres. Practically every wound is more or less infected, though I seem to have seen an improvement in that regard during my stay here. It is splendid to see, from the soldiers' cards, how many have had their injection of antitetanus serum. If a rifle bullet or bullet from a shrapnel passes right through a limb without fracturing a bone, little trouble usually results, and after removing any dirt that may be seen, we just pour in more iodine, swabbing the skin about with it, and apply an aseptic dressing or dressing of cyanide gauze. It is difficult to do much more than this in the "sheds." Of course, the wounds caused by the explosion of a shell are generally much worse; large pieces of the soft tissues are torn away, a neighbouring bone is shattered, and often pieces of the metal are left imbedded in the flesh. So many of these cases seem to have fractured jaws, and one night we saw a man with literally the lower half of his face shot away. The French use iodine and hydrogen peroxide with dry dressings. It is such a pity we are not able to follow up all the cases we see in the "shambles."

The French *brancardier* is an exceedingly willing worker and there are always plenty of them about. They are on for twelve or sixteen hour shifts. But they might be a little better trained in the careful handling of the wounded, in lifting the cases on and off the stretchers. Besides the purely medical and military workers, there is always a priest on hand. One of these men is a very jovial fellow who goes about distributing cigarettes (they seem a godsend to the wounded) and candies, and often he brings out socks or other articles of clothing from his store room. Then some English ladies pass around hot drinks of soup, coffee, or malted milk, and a French boy scout (I shall not try to spell it as they pronounce the word here), a very nice young fellow and son of a French army surgeon, gives them much help in this work.

Such a place as "the sheds" quite naturally has many visitors. Some of these are merely curious people, and now all the British have to carry cards with their hours for work marked on them, for a short time ago the place was sometimes much overcrowded. Occasionally there are medical visitors. Dr. Alexis Carrel came the other evening to look about and Professor Niveau Lemaire, the author of the splendid "*Précis de Parasitologie,*" visited us. He is in charge at the hospital in Dunkirk, the "Caserne Jean Bart." Of course there are the usual correspondents of English papers and numerous friends of people who have hospitals in Malo-les-Bains.

As it has been my function to keep "Villa St. Pierre" full of cases, and to work there at night, I have not been able to follow up many cases closely. But some, I think, are worthy of mention.

CASE 1. *Acute myelitis.* R. C., aged twenty years, was admitted on the 10th of December, with the following history, which he gave me at the railway sheds. Six days ago after a week in the trenches and after ten hours on the last day spent standing in water up to his arm pits, he completely lost use of his legs, and sensation completely disappeared in them and over the trunk as far up as the umbilicus, he said. The lower limbs became swollen and "inflamed". He did not suffer from retention, but experienced some difficulty in micturition. He had suffered from gonorrhœa two years ago, had some sort of head accident last January, but has been perfectly well since. No history of syphilis. On admission, temperature was 97°, pulse 70, and respiration 20; did not look collapsed, and said he was feeling better. On examining the legs the feet were somewhat swollen; he was not able to move the toes or bend the ankles or knees. Skin sensation to pain and touch stimuli was completely lost as far up as Poupart's ligament. Knee and ankle jerks were much increased, but there was no patellar or ankle clonus. No Babinski phenomenon. He was constipated, but, except for some difficulty on micturition, nothing else of note was found. Some difficulty has been encountered in trying to move the bowels and to keep them open by the use of castor oil. Except for a rapid rise of temperature, after constipation for two days, from normal to 102·4°, which dropped the next day to normal, there has been nothing to report on the chart. To-day (December 21st) after gradual improvement we find he can move the toes of both feet a little (especially the extensors), but cannot bend either ankles or knee joints. He cannot raise himself up to sitting posture unaided, and if lifted up, has to support himself with his hands on the bed behind. Knee and ankle jerks are still increased and there is no Babinski. Cremasteric and abdominal skin reflexes are very active. Touch and painful stimuli are felt, but less acutely than is normal, up as far as groins. Over the abdomen sensation is normal. He complains of pain, on pressure, in the lumbar region. Apparently he was suffering from acute myelitis consequent upon a vascular change, and is gradually getting better.

CASE 2. *Acute insanity.* A French soldier was seen on a cot in "sheds," evidently a case of acute insanity, and those of us who saw the poor fellow will never forget him. He was a man apparently about twenty-five to thirty years of age, of pale countenance, and rather drawn appearance. He seemed to be lying quietly on his side, when suddenly he would start up, look away off into the distance with terror written strongly on his face, and biting the ends of his fingers he would seem to follow the flight of a shell as it gradually came towards him. He would get up on his knees and when his glance reached the roof, right above him, he would utter a sharp cry, shake all over, and bury his head in the pillow. This performance was repeated every few minutes. This is the only case of such a kind seen down there, but they say there have been many. It seemed a hopeful sign that we were able to persuade him to eat and drink something. But it was a sad sight and the *brancardiers* turned away exclaiming, "*C'est tres triste, tres triste.*"

CASE 3. *Compound fractures; tetanus; recovery:* Never were the horrors of war brought so forcibly to me as when I chanced to see a young British officer whom I knew and when I was able to hear and read his story. As a cavalry officer he was called upon to dismount and fight in the trenches. On October 29th he was struck by an exploding shell. His right arm was broken in several places, and pieces of the humerus protruded, his right shoulder was much torn and his scapula chipped; a piece of shell made a gash over his right lower jaw, and fractured it, and besides these wounds he had scratches elsewhere. He got to a base hospital in one day, but soon developed tetanus. He slowly recovered and on December 7th was in good spirits, the first and only time I saw him. The nurse outside his room was not able to say whether he had had antitetanic serum immediately, but he was injected later with it, and was kept under the influence of chlorotone, and was given hypodermic injections of 2 per cent. carbolic. However, no attempt could be made up till that date to attend to the arm properly.

I have said that it is difficult to prevent taking in typhoid cases. Here is the story of one poor fellow:

Case 4. *Perforated typhoid ulcer; general peritonitis; operation; death.* J. B., aged twenty-five, French soldier. At the station the French surgeons pointed him out to us after midnight as a case of peritonitis. We were keen to get him into the hospital. The poor fellow's face was drawn and he looked extremely ill. He was lying on the cot with his knees bent up and moaning in great pain. His abdomen was much distended, the breathing purely thoracic, and his belly so sensitive that he would not allow us to palpate it. He gave a history of only three days' illness, and no more could be gathered from him. On admission his temperature was 103°, pulse 48 and running, and respirations 36. He was regarded as a case of general peritonitis, probably resulting from a ruptured appendix. A few hours delay was unavoidable but he was partially anæsthetized with ether on his bed and brought to the operating room. The abdomen was opened by Dr. Nucholds with the usual gridiron incision, and a quantity of thin yellow fluid containing flakes of lymph escaped. This had a fæcal odour. The appendix was found like the rest of the bowel to be reddened and inflamed, but there was no abscess or rupture. It was removed, though it was thought that it was probably not the cause of the whole trouble. Further exploration was made and about ten inches from the cæcum a perforated typhoid ulcer was found in the ileum. This was sewn up as quickly as possible, no other perforations could be discovered and drainage tubes were put into the operation wound down into pelvis. During the operation saline was given under both breasts. Patient's pulse dropped to 120 and that evening he seemed a little brighter. Subcutaneous saline was repeated and a rectal saline four hours later. He began to sink about 2 a.m. the next day, and was given a hypodermic of pituitrin at 5 o'clock, but died soon after.

Yours very sincerely,
T. A. Malloch.

Canadian Literature

Original Contributions

The Canadian Practitioner and Review, January, 1915:

The surgical treatment of infantile paralysis	C. L. Starr.
Some advantages of litholapaxy over lithotomy	R. Pearse.
The early diagnosis of pulmonary tuberculosis	J. S. Emans.
Headache in diseases of the ear, nose and throat	G. Royce.

The Canadian Journal of Medicine and Surgery, January, 1915:

The early diagnosis of dementia precox	C. K. Clark.
The necessity for institutional treatment for inebriates	T. D. Crothers.

Dominion Medical Monthly, December, 1914:

The uses of petroleum in the treatment of constipation and other diseases in infants	E. Pritchard.

The Public Health Journal, January, 1915:

The trend of advance in town planning and child welfare within the Empire	J. G. Adami and Helen MacMurchy.

The enumeration of bacteria in milk .	J. Race.
Sanitation in the early days of Winnipeg	E. Marston.

The Western Medical News, November, 1914:

Mixed infection. Diphtheria and scarlet fever	J. A. Rose.
Essential hæmaturia	F. A. Corbett.

Western Canada Medical Journal, December, 1914:

Nomenclature, etiology and treatment of rheumatic infection . .	Geo. W. McIntosh.

The Canada Lancet, January, 1915:

Psychoses and neuroses of urogenital origin	Noah E. Aronstam.
Faulty vision as a factor in ill health .	W. W. Kabar.
The Canadian Red Cross Society and its work	G. Sterling Ryerson.

Le Journal de Médecine et de Chirurgie, December, 1914:

L'hematometrie et l'hematocolpocete	E. St. Jacques et R. Filardeau.

Medical Societies

ANNUAL MEETING

Canadian Medical Association

Arrangements for the meeting which is to take place this year in Vancouver, July 6th to 9th, proceed apace and everything points to a most successful issue. The main attraction of the meeting will undoubtedly be the two symposia, one on "Chronic Arthritis," and the other on "Chronic Infection of the Kidney."

The first of these subjects is a particularly happy choice and will undoubtedly afford a great deal of interesting discussion from the medical, surgical, orthopædic and pædiatric branches. In past years such symposia have been of enormous value to the general practitioner, who is vastly in the majority at our meetings and should be considered first in the programme. Those who have promised to take part in the symposia include many of the foremost men in Canada, and that in itself is a sufficient guarantee of interest.

There is an old story, known to all, of the wise men who came from the East. Some have already gone West and it is hoped that this summer a large number will follow suit—if only for a brief visit—and will bring gifts, not of myrrh, etc., but of the fruits of the intellect.

ONTARIO MEDICAL ASSOCIATION

The programme of the Ontario Medical Association meeting in Peterborough, May 25th to 28th, is almost completed, and promises to be most interesting. The addresses will be given by eminent men from the United States, and the other papers will be from outstanding medical practitioners all over the province. The Medical Health Officers' Association is to meet in conjunction with the Ontario Medical Association and a very large attendance is assured.

Peterborough has made every preparation to look after the large number of visitors expected. There are plenty of excellent hotels, and the large drill hall will give ample accommodation for all meetings. The Committee on Papers and Business are now sending out notices to those who are taking part, and it is hoped next month to publish the provisional programme in full.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The following is the preliminary programme of the Montreal Medico-Chirurgical Society.

February 5th: The use of salvarsan in pernicious anæmia, by H. A. Lafleur; February 19th: Clinical evening at the Montreal General Hospital; March 5th: Pressure paralysis, D. A. Shirres; March 19th: Fat metabolism, including its relation to acidosis, Mr. Motram; April 2nd: Arteriosclerosis, A. H. McCordick; Some observations on eclampsia, T. F. Cotton; April 16th: Some unusual features of surgery of the biliary system, E. M. von

Eberts; May 7th: The practical diagnosis of pulmonary tuberculosis, E. S. Harding; May 21st: Symposium on infant feeding; June 4th: To be announced; June 18th : President's smoker.

THE second regular meeting of the Society was held Friday October 16th, 1914, Dr. F. W. Hamilton, president, in the chair.

LIVING CASES: 1. Liver abscess, by Dr. Geo. E. Armstrong.

Liver abscess is not a very common condition in our hospitals in Montreal and I thought this case might be worthy of your attention. The patient, a man fifty-three years of age, entered the medical wards of the Royal Victoria Hospital August 6th, complaining of pain in the right side of the abdomen with loss of weight and weakness. He was born and practically lived all his life in South America, and enjoyed good health until six months previous to admission to hospital. One month after coming to Canada he complained of slight pain around the umbilicus which increased until six months ago when it went away. Two weeks before admission the pain around the umbilicus recurred, radiating to both flanks and around to the back, and fairly severe. It bore no relation to food, lasted two or three hours, and very often came on at night; no vomiting, nausea or hæmatemesis; no jaundice; appetite fair. In June he was free from all distress, but the symptoms returned in July and were very severe. One week ago had a severe stabbing pain about the umbilicus, radiating to the right side and back around lower dorsal vertebra, pain severe; no chill, no urinary distress or sweats, no jaundice, no fever. Lost twenty pounds in six weeks. Measles and mumps as a child, malaria three or four times; used alcohol considerably until a year ago.

When admitted to the surgical side the right lobe of the liver was seen to extend down nearly to the right iliac fossa. The liver felt smooth, the sharp border distinct and easily palpable. An exploratory operation was undertaken and the liver, exposed in the incision, appeared not much out of the way except for its size; the exposed part was almost normal and free from evidence of inflammatory trouble. On passing the hand up over the dome of the liver a large swelling was encountered right on the top of the liver lying under the dome of the diaphragm. Here lay the whole trouble; the tumour had pushed the liver down giving it the low displacement. This swelling on the liver was soft, boggy, and pitted on pressure and gave one the impression of deep fluctuation. To drain this through the abdomen seemed hazardous. The tube would have to be carried out over the liver under the ribs, so it was decided to close the abdomen and approach it through an intercostal space. I then excised a portion of the seventh rib and after removing it and clearing away I found that the lung was pushed well up so I put a row of sutures right around this space after the portion of the seventh rib had been removed; in that way I sewed the two pleural surfaces together and to the upper surface of the diaphragm and succeeded in doing that so tightly that when I opened the pleura no air entered. I then went through the pleural cavity, through the diaphragm, and in that way approached very directly upon this huge abscess. I aspirated nearly forty ounces of thick pus from this abscess and put in a tube, packed all round with iodoform gauze walling off the peritoneal cavity and trusting to adhesions forming to protect it. He did very well for a while and drained perfectly but the drainage stopped and his temperature began to go up a little and I thought perhaps the tube had become displaced. I again gave him an anæsthetic and found the abscess reforming and the tube lying free above the liver in the dome of the diaphragm. The liver in coming up had rotated just enough to rotate the opening away from the tube. I then inserted another tube and by measurement between 20 and 30 ounces were again removed. He began to improve after that and continued to improve and to-day is practically in perfect health. This suturing of the two pleural surfaces together can be done quite safely as we have done in approaching lung abscesses, and in this case the two layers were also sewed to the diaphragm. He never had any history of amœbic trouble and in the scrapings from the abscess wall and in the abscess itself no amœba were found, but colon bacilli, staphylococci and streptococci.

2.Arthrodesis of the elbow joint, by Dr. G. E. Armstrong.

This case is one of considerable interest. The man suffered a traumatism to his elbow and was admitted to the hospital some little time afterwards with an acute suppurative osteo-myelitis involving the upper shaft of the end of the ulna. The shaft was dealt with very thoroughly, trephined in many places, but the inflammation extended until practically the whole shaft of the ulna suppurated out so that the man has now only one bone, the radius. The periosteum, however, is left and I think it is already reproducing new bone. In addition the patient had pathological dislocation of the elbow joint, the whole upper end of the radius came out and the dislocation made it impossible for him to get any flexion.

I thought the first thing to do would be to try and give him a movable elbow joint so I removed a part of the head and neck of the radius, made as good a concavity of the upper end remaining as possible, and shaped off the trochlea and fitted it as well as I could, I then threw down a portion of the triceps together with as much fascia and fat as could be obtained and stitched this flap between the radius and humerus. I am getting now a movable joint. He can carry his hand up to his mouth and feed himself and straighten his arm out to a fairly decent angle. It is comparatively soon after the operation and I hope to show the patient again.

If the ulna is not reproduced it might be interesting to consider transplanting another bone, but even as it is it gives him a very useful hand and arm. This subject is rather a vexed one just now and has two classes of adherents: Murphy representing transplantation of tissue between the fragments, and Lexer, representing the school which transplants the whole joint. I have never had an opportunity of doing this last. So far I have never been able to get the two conditions for this operation together at the same time. Whether this will be a better joint than an ordinary old-fashioned excision of the joint remains to be seen. It will, I think, be more firm, giving a freer range of motion, particularly in this case as I have only one bone. Simple old excision would have made a pretty wobbly joint and I think he can do a good deal with the joint as it is now. I may say that Lexer's joint work is very nice. I was in Jena last summer and I saw there the girl into whose leg he has transplanted another knee joint. She was assisting in the room next the operating room, helping with the coats, etc., and could bend down on both knees and walk about doing her duties with no apparent inconvenience.

DISCUSSION. Dr. A. E. Garrow: In the report of the first case I would like to know what was the nature of the infection discovered in the abscess. At the last meeting of the Canadian Surgeons in 1913 I showed a case of acute abscess of the liver which presented the symptoms of perforated gastric ulcer with a history of only four days. The young man had severe epigastric pain, vomiting, moderate temperature, constipation, rigidity in the epigastrium and all the hall-mark signs of an ordinary gastric or duodenal ulcer. On opening the abdomen I was rather surprised to find no pus on the anterior wall and the greater curvature of the stomach, which came into view, presented no evidence whatever of any organic lesion. In passing my hand beneath the liver I did not notice anything unusual but on passing it over the upper surface of the liver, between it and the diaphragm, it became covered with pus—I had entered a leaking abscess cavity in the liver and it contained about thirty ounces. Cultures from this cavity proved to be negative. I drained it through the incision in the abdominal wound by carrying a tube around the upper opening and brought it out between the liver and the lesser curvature of the stomach. He made an uninterrupted recovery and returned home within twenty or twenty-one days. There was no previous history of gastro-intestinal distress and as the symptoms were acute I looked upon it as an ulcer of a malignant type.

Dr. G. E. Armstrong: The bacteriologist failed to find any amœba though colon bacilli and staphylococci were present.

PATHOLOGICAL SPECIMENS: Series by Dr. L. J. Rhea.

1. Acute endocarditis in chorea gravis. Girl, aged nineteen, always nervous. A year previous to admission began to throw her hands about and move her feet without any purpose; these movements increased gradually for about eleven months and became very severe. One week before admission to hospital movements so severe that she could scarcely walk; twitching of the face, wringing of the hands and shaking of the feet; was restless at night, would scream out and pick constantly at the bedclothes. Was in hospital eight days. A diagnosis of chorea gravis was made; movements sometimes so severe that she threw herself out of bed. An interesting finding at autopsy was that in the heart both the mitral and aortic cusps showed early acute exudation.

2. Heart from chorea gravis. Patient entered hospital four days after the previous case. Young boy aged eight years, always nervous and highly strung, but never any definite symptoms of chorea until a week before present illness, when he began to have twitchings of the fingers which became more generalised and he developed chorea gravis. The child had a very high temperature and at autopsy the condition of the heart showed acute exudation of both mitral and aortic cusps. In the direct smears from the exudate of the valves streptococcus was found which conforms in general character to the organisms that are found in these cases.

3. Ruptured tubal gestation. The woman came under Dr. Lockhart's service with symptoms referable to her lower abdomen, most marked on one side. She was aged forty. Vaginal examination showed uterus to be enlarged and free blood was discharged; proved to be simply a blood clot, no cells from lining mucous membrane and nothing to suggest that the woman was pregnant. A diagnosis of extra-uterine pregnancy was made and an ectopic gestation in one tube found. At the operation this tube ruptured and a large amount

of blood escaped. The specimen shows the large tube, the fœtus intact, the umbilical cord and the sac in the dilated tube.

Discussion: Dr. W. F. Hamilton: I would like to ask Dr. Rhea what was the cause of death in the cases of chorea. We are all familiar with the condition but it is rare to have death from this cause.

Dr. L. J. Rhea: In the case of the child we got the organisms from the spleen and from the blood. The high temperature was suggestive that he had a general infection. In the other case it is difficult to say just what was the cause of death, but one has to consider here, besides the infection, the possibility of exhaustion, as the movements were so severe and continuous.

Case Reports: 1. Division of sphincter of ampula of Vater for relief of biliary calculus with glycosuria, by Dr. E. M. von Eberts.

Discussion: Dr. E. W. Archibald: May I be allowed to indicate one or two particular points of interest in Dr. von Eberts' communication which might otherwise be unnoticed. The essence of the case report lies in the nature of the operation. That the duodenum should be opened and the sphincter of the ampulla cut as a measure of promoting drainage of bile, may sound at first as if one were going beyond the mark; and yet to anyone understanding the physiological conditions present such would not really turn out to be the case. The sphincter of the common duct is in many cases of pancreatitis the real cause, and is the point to be attacked. If in spasm it may drive bile back into the pancreatic duct and set up pancreatitis. With a contracted gall bladder which to a large extent had lost its function, with the evidence of some pancreatic involvement, and with, in addition, the presence of sugar in the urine, the suspicion at least was justified that the glycosuria was due to the swelling of the pancreas. One must admit that glycosuria is not a common occurence in pancreatitis; it is usually not until the islands of Langerhans have been put out of action by the inflammatory process that sugar will appear, and this is usually a rather late result. While the result in this instance may not amount to actual proof of the value of cutting the sphincter of the ampulla of Vater, it is to say the least suggestive. If it should be proved that this operation in the human, as it has been already proved in the lower animals, prevents all regurgitation of bile into the pancreatic duct by taking away all obstruction to its outflow into the intestine, and provides free and permanent drainage of bile into the gut, then the original cause of many cases of pancreatitis would be removed. I am quite convinced myself that cutting the sphincter of the common duct is a sure means of producing a permanent and easy drainage of bile. In experiments it could be seen that the pressure under which fluid issued from the common duct after the sphincter was cut, was reduced practically to zero, whereas previously it was found to rise from 300 to 700 mm. of water. Not only that, but it was possible to show that cutting of the sphincter had a permanent effect. The sphincter action is not reëstablished and the pressure in subsequent experiments is found to remain near zero. Whether the operation of cutting the sphincter is to be done with any frequency for chronic pancreatitis is of course a question. I believe myself that cholecystostomy, with bile drainage maintained for two or three months, will remain the operation of choice as a first operation in all cases of acute, subacute and chronic pancreatitis. This acts as a safety valve, reducing any undue pressure of bile in the common duct, such as might be set up by a spasm of the sphincter, and this allows nature to cure the pancreatitis in her own way. Only in case of a recurrence of pancreatitis after such a cholecystostomy would it seem advisable to me to proceed to cut the sphincter of the common duct. My reason is that, in animals at least, cutting of the sphincter usually leads to an ascending infection of the biliary tract. The infection, it is true, if mild, seems to cause no symptoms, the animals remaining healthy, and may after some time disappear. It is nevertheless an unwelcome complication. I note that in Dr. von Eberts' case it seems to have been without consequence. When glycosuria complicates a chronic pancreatitis and can reasonably be supposed to be an effect of the pancreatitis (as in Dr. von Eberts' case) the argument for cutting the sphincter at once becomes stronger, inasmuch as glycosuria from such a cause is likely to be long standing and due to chronic sclerotic processes, while the cholecystostomy can hardly be kept effective for more than two or three months.

Dr. von Eberts: I would only reiterate the point that in this case the operation performed was indicated as the gall bladder was entirely obliterated and no opening could be found in the cystic duct. There was no question here of employing the gall bladder route as a means of drainage. The operation itself was suggested by the experimental work that had been done before.

Dr. E. W. Archibald: I wish to express my admiration of the brilliant results of Dr. von Eberts' operation. It is the first time this has been done in the human. Under the circumstances it seems to me it was the proper thing to do. The contracted gall bladder was practically of no functional value; the tendency later would have been for the common duct to be dilated, and there was evident need for a free and easy drainage of the bile into the bowel which could only be accomplished by this cutting of the sphincter.

DEMONSTRATION: Balantidium coli and other parasites, by Dr. J. L. Todd. Dr. Todd showed under the microscope various forms of infusoria.

PAPER: The paper of the evening was read by Dr. A. E. Garrow on exophthalmic goitre.

DISCUSSION: Dr. G. E. Armstrong: I must congratulate Dr. Garrow upon his very able presentation of this interesting subject, and in presenting it with such a broad perspective. A few years age we knew all about hyperthyroidism. The exophthalmic goitre was due to the excessive secretion and the opposite was due to insufficient secretion and operative work as a general rule confirmed this theory. When we think of a thousand cases a year that Mayo does and the results that he gets it seems to bear out this theory. But a part of our new view is that the results are not always satisfactory and it comes about that we have to select and differentiate these cases. The two most interesting features are, first, the sympathetic theory mentioned by Dr. Garrow. It is an old theory. Trousseau thought that the exophthalmos might be very largely associated with sympathetic troubles but until Landstrom demonstrated his streaked microscopic muscle we did not seem to have a satisfactory working theory. This muscle is under the control of the sympathetic, its action is to pull the eyeball forward and the lids back and when the sympathetic is stimulated it contracts this muscle and pulls the eyeball forward and the lids backward. The removal of the superior sympathetic ganglion just above the bifurcation of the carotid relieves exophthalmos and does it quickly. This has been a decided advance in our knowledge of this subject. Of course we have to suppose that the thyroid secretes something which stimulates the sympathetic to act on this muscle as described by Landstrom. The other point mentioned is extremely interesting. We have all seen cases where the tachycardia is extreme, the weakness is extreme, where the blood condition as described by Kocher is present in a well marked degree and with a small insignificant thyroid: these are the worst cases, they give us the sudden deaths—die after the ligature of an artery. And now comes the thymus. So far as I know Garré and his assistant, Capelle, were the first to give us the theory that in the thymus substance there is a heart poison and that the tachycardia was due to something secreted by the thymus. His assistant in a case of well marked Basedow's disease removed a part of the thymus and the patient experienced all the signs of well-being, the heart returned to a good beat and the lymphocytosis passed to 10 from 40 per cent., but the exophthalmos remained the same. Other cases gave the same results. One case, previously operated on by Kocher, later came to Haberer cyanosed, with bloody expectoration, his condition extreme and the physicians thought it impossible to do anything for him. He remained in hospital for some time under rest begging always for an operation which finally was done, a portion of the thymus being removed. The improvement in that man was remarkable and prompt and about a year afterwards he was perfectly well with a normal heart action. He had two other such cases. It would seem that in rare and exceptional cases partial thyroidectomy is not sufficient; we can lessen the exophthalmos in cases where the eyes do not recede after operation by removal of the sympathetic ganglion and it may be shown that these extreme cases of tachycardia with very small thyroids may be better dealt with in the first instance by taking away a portion of the thymus. All this work seems to establish a working relationship between organs and tissues, perhaps at present best thought of as a chemical or physiological correlation of influences.

Dr. H. A. Lafleur: I also wish to thank Dr. Garrow for his extremely interesting, lucid and sane presentment of the subject of exophthalmic goitre. I have always felt that exophthalmic goitre was essentially a medical condition and in a very considerable number of cases it became the duty of the physician to call in a surgeon. Those who have had experience will call to mind a few instances where the patient got well for all practical purposes by purely medical treatment. I know three cases here in Montreal who are perfectly well, one after an interval of fifteen years, one after six or seven years, and the other a matter of two or three years. This last one should not perhaps be taken into account as she may possibly have a relapse. These were treated on purely medical lines. It ought to be emphasized that the treatment must be of a very persistent and prolonged character, and unless the patient is absolutely willing to coöperate faithfully, it is really of no use; it means rest in bed not weeks but months. I believe that, medically speaking, rest is the all important thing, all other measures are subsidiary; perhaps in certain cases restriction of the diet, of the use of tea and coffee, etc., are advisable. Perhaps they do better on a meat-free diet, but the essential thing is rest of a most suitable kind, not only of the body, but of the mind. It is a difficult question how long one should continue an expectant rational medical treatment before resorting to one or other of the surgical measures. There are certain cases where you can tell after perhaps six or eight weeks that it will be necessary to resort to some surgical procedure. At the same time when we hear, as we often do, of cases that appear to be extremely fabourable for surgical intervention who die, as Dr. Garrow's case did, when everything appeared to be doing well, it naturally makes one hesitate to advocate surgical measures as long as the patient is doing well under purely medical treatment. Unfortunately patients often won't submit to prolonged treatment and would rather take the chance of surgical interference than prolonged rest. I would like to emphasize the fact that half measures, medically speaking, are worse than useless.

Dr. A. H. Gordon: One thing has been impressed upon me of late in connexion with this disease and that is the very grave amount of emaciation present. Within a short time two women came under my notice both having lost very great amounts in weight within a period of months; one thirty pounds, and another twenty-five pounds. One came under the impression that she had tuberculosis, and another diabetes on account of this great loss of weight. Both cases have turned out satisfactorily, one I think is included in Dr. Garrow's table, the other was put under medical treatment and she also has regained a very considerable degree of health and has returned to her former weight.

Dr. E. W. Archibald: There are quite a number of cases in which the diagnosis of exophthalmic goitre remains a little doubtful. There is a fairly broad border line between simple goitre and the exophthalmic type. Such doubtful cases I have lately been testing out with small doses of iodide of potash following Kocher's advice. Small doses of this drug have brought out the symptoms of exophthalmic goitre very clearly when they were, so to speak, larval at the first examination. The advantage of such a therapeutic test is evident; the surgeon is on his guard, and if he decides to operate he is possibly more inclined under such circumstances to hand the patient over to a medical man for proper medical treatment before instituting surgical procedures.

Dr. W. F. Hamilton: I wish to remark upon one indication for the treatment of patients suffering from exophthalmic goitre. The nutrition of such patients is of first importance in my opinion and to restore and maintain the body weight is my chief aim. Rest and good feeding are essential and patients should be put to bed for several weeks when the treatment is undertaken. As an adjunct to this ergotin and quinine may be given and their use continued over many months. Recently I have been gratified with the good results in three cases treated by this method during the last eighteen months. While the explanation of the therapeutic effects of these two agents is not satisfactory, yet according to Meyer and Gottlieb quinine in small doses "spares the tissues of the body." Barger and Dale have shown that aqueous extracts of ergot contain two bases whose actions closely resemble that of epinephrin. Probably the combined action of these agents on nutrition and circulation when given over a long period may explain the good results seen in some cases.

CASE REPORT: Miliary tuberculosis, with certain unusual features, by Dr. A. H. Gordon and Dr. Birchard.

This case illustrates the difficulty in diagnosis between typhoid fever and some of the acute types of tuberculosis. The patient was a young Norwegian sailor, aged eighteen, who was brought to the hospital on June 18th, 1914. Since the 4th of June he had felt ill with headache, weakness, and abdominal pain; the latter was not severe as he had been able to perform his duties on board ship. His bowels had been constipated and had been relieved by Epsom salts. On examination he appeared a clean, bright looking young fellow, fairly nourished, with a clear skin and bright colour, but with a marked pallor about the mouth. There was a frequent, dry, unproductive cough and a few glands were palpable in the posterior triangle of the neck. He had some pain in the lower left axilla on deep breathing, there was a slight pleural friction which persisted for only one day. Except for a few dry râles there were no other physical signs in the chest. The abdomen was slightly distended and somewhat tender and there were no rose spots. The spleen was not felt, but the liver was quite palpable. The nervous system gave no physical signs. He went on in the clinical course of apparent typhoid even to the point of a dicrotic pulse which remained under 100 while the temperature kept steadily between 102° and 104° and the leucocyte count remained low. On the other hand his blood culture yielded no growth, the Widal reaction was negative, and no rose spots appeared. On the afternoon of June 19th, he was noted to be moaning and turning frequently in bed and picking at the clothes. His pulse rose to 120° and became irregular and he now complained bitterly of abdominal pain and the abdomen became very tender and resistent.

The question of typhoid perforation naturally arose but with his delirium and muttering he now developed marked retraction of the head and a definite Kernig's sign. A lumbar puncture was done and 35 cc. of turbid fluid with numerous flocculi was withdrawn under great pressure. Microscopically it showed 1920 leucocytes per c.mm. of which 70 per cent. were polymorphonuclear. Stained for tubercle bacilli they were found in enormous numbers, as many as are usually seen in a bad tuberculous sputum. He died on the twenty-sixth day of his disease and at autopsy the body showed practically a universal tuberculosis, the lungs, liver, spleen, kidneys, intestines, the pericardial sac and the meninges being literally peppered with miliary tubercles of uniform size and the left pulmonary veins showing a true tuberculous thrombus. A tuberculous ulcer in the ileum was the apparent primary focus.

The points of most interest therefore were (a) the simulation clinically of typhoid fever, even up to the signs of perforation, (*b*) the extraordinary number of tubercle bacilli in the spinal fluid, its turbidity, and the large number of leucocytes with a preponderance of polymorphonuclear cells, and (*c*) the almost complete absence of physical signs in the chest in the presence of so marked an involvement.

Discussion: Dr. F. M. Fry: I would like to know if anyone has ever seen another case of tuberculosis meningitis with the polymorphonuclears predominating in the spinal fluid. My experience in children is that one of the most constant signs is the predominance of the mononuclear cells.

Dr. L. J. Rhea: I have occasionally seen cases where they do predominate; in one case where there was an epidemic of cerebrospinal meningitis at Boston I did an autopsy and made a diagnosis of acute cerebro-spinal meningitis but failed to demonstrate the organisms. The predominating cells were polymorphonuclear leucocytes. Staining for tubercle bacilli showed them in large numbers.

Dr. E. M. von Eberts: Did not Dr. Theobald Smith point out that when tubercle bacilli were found in such numbers, they usually gave the reaction for the bovine type? I reported a case of solitary tubercle of the breast in which polymorphonuclears and bacilli were present in large numbers. Dr. Duval considered the infection of bovine type. We had also at the General Hospital two neck infections in which the necrotic tissue showed countless numbers of bacilli in every slide. They were also proved to be bovine infections.

Dr. L. J. Rhea: I believe Dr. Smith has referred to this but the organism in my case was not bovine.

Dr. W. F. Hamilton: It was pointed out several years since that in acute pleural effusions the polymorphonuclear leucocytes predominate early in the course of the disease and the effusion becomes chronic when the leucocytes predominate. In Dr. Fry's case a fulminating process existed in the meninges, this explaining the reaction and the variety of leucocytes found.

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THE INVOLVEMENT OF THE CENTRAL NERVOUS SYSTEM IN SYPHILIS*

By Arthur W. M. Ellis, M.B.

THE four years which have elapsed since the introduction of salvarsan have been a period of rapid growth in our knowledge of syphilis. Perhaps the most important of these advances have been the facts which have been determined and the new conceptions which have been introduced concerning the involvement of the nervous system in the disease. The facts which have been established have affected chiefly our knowledge of the two extremes of the disease process. On the one hand, examination of the spinal fluid in the primary and secondary stages of syphilis has given us new knowledge of the very earliest stages in the course of the infection, while the discovery by Noguchi and Moore[1] of the spirochæta pallida in the brain of patients dying from general paresis has illuminated greatly our understanding of the late stages. The determination of these facts has added very materially to the data on which to build a conception of the course of the syphilitic infection within the central nervous system, and has especially played a revolutionary part in the treatment of patients with both late and early syphilis. In this communication an attempt will be made to outline our present conception of the course of the syphilitic process in the central nervous system, and to point out the significance of this conception in formulating a rational therapy in the various stages of syphilis.

Syphilis is a chronic infectious disease caused by the spirochæta pallida. The disease starts as a local infection which rapidly becomes generalized, so that during the late primary and early secondary stage we are dealing with a true septicæmia. The early period at which this general distribution of the virus occurs and the truly septicæmic character of early syphilis have recently been established by the valuable experiments of Uhlenhuth and Mulzer.[2] These investigators, by means of injections of defibrinated blood into rabbits' testicles, were able to demonstrate the virus in the blood of sixteen out of nineteen cases of primary syphilis. In many of these patients the Wassermann reaction had not yet become positive. Twenty-seven out of thirty-six cases of early secondary syphilis also gave positive results. These results demonstrate conclusively the septicæmic character of the infection in the early stages of the disease and readily explain the wide dissemination of the virus which occurs at this period.

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* From the Hospital of the Rockefeller Institute for Medical Research, New York. Read at the Annual Meeting of the Ontario Medical Association, Toronto, May 26, 1914.

If, then, in secondary syphilis we are dealing with a massive infection of the blood with the spirochæta pallida, we would not expect that the nervous system would escape in the wide dissemination of the virus which necessarily results, but would think that the meninges would also frequently become involved. Much evidence is now at hand that this is indeed the case. It has been known for many years that occasional patients with syphilis, especially those with the more severe skin manifestations, the marked papular and the early ulcerative skin lesions, suffered from extensive involvement of the central nervous system during the first year of the infection. Moreover, whenever an occasional observer has become especially interested, he has found affections of the cranial nerves, especially the auditory and optic, as fairly frequent occurrences in secondary syphilis. Thus in the University clinic in Graz, Habermann[3] and Mayer[4] saw sixty-five cases of involvement of the auditory nerve in the first year of the disease. Wilbrand[5] in Hamburg examined the eye-grounds of two hundred cases of early syphilis; and found hyperæmia thirty-eight times, neuroretinitis five times, and retinitis and retinal hæmorrhage once. These observations were made long before the advent of salvarsan. Many similar observations could be quoted. They show how frequently signs of involvement of the central nervous system are found, if carefully looked for, in the secondary stage of syphilis. The results of the examination of the spinal fluid have confirmed this conception that slight degrees of inflammation of the nervous tissues and its coverings are common early in the disease.

In 1903 Ravaut[6] examined the spinal fluid from one hundred and sixteen cases of secondary syphilis and found abnormalities, slight increase in cells or globulin, in 67 per cent. of these fluids.

No further observations of this character were, however, made until 1912, when a number of investigators reported on the findings in the cerebrospinal fluid in cases of early syphilis. The most extensive of these observations are those of Altmann and Dreyfus and of Gennerich. Altmann and Dreyfus[7] examined the spinal fluid in eight cases of primary and fifty-six cases of untreated secondary syphilis. Two of the eight fluids from their primary cases showed cell counts of eight and thirteen respectively; both of these showed also an excess of globulin. Of the fifty-six fluids from untreated secondary cases examined by them, 66 per cent. showed some increase in cells or globulin. Seven of the fluids showed very marked changes, that is, counts of between seventy-five and five hundred cells per cubic millimetre, with a strongly positive globulin reaction and a positive Wassermann reaction in the fluid. These marked changes all occurred in patients in the late secondary stage. Gennerich,[8] from the German Naval Hospital in Kiel, has recently reported on the changes in the spinal fluid in the early stages of syphilis. His opinions represent the result of a very careful study of the enormous material at his disposal. He examined the spinal fluid in sixty-three cases of primary and ninety-seven cases of secondary syphilis, and states that at some period, either before or during the treatment, 90 per cent. of these fluids showed some abnormality. At the hospital of the Rockefeller Institute in 1912, Dr. Swift[9] and I examined the spinal fluids of twenty-two patients with untreated early secondary syphilis. Our findings, 33 per cent. of abnormal fluids, are much lower than those of most observers, the discrepancy being probably due, in part at least, to the fact that all our patients were in the very early secondary stage.

From the above observations it is evident that infection of the central nervous system occurs in a large proportion of cases of secondary syphilis, possibly in every case. Since we know that it is only the exceptional case which subsequently shows involvement in the late stages of the disease, it is evident that in many cases this infection must undergo a spontaneous resolution. This is in keeping with the course of syphilis elsewhere in the body, and is probably due to the altered tissue reaction or allergy, which develops during the secondary stage of the disease as the result of prolonged contact between parasite and host. As a result of this altered tissue reaction the secondary eruption disappears, and skin lesions may never be manifest again, even though the patient remain entirely untreated. Moreover, if skin relapses do occur, they steadily change in character. The lesions are at first almost universal, but with each relapse they become more localized, tend to group, and involve deeper structures until finally the gummatous stage is reached. Frequently a long period of complete latency ensues between the secondary eruption and the development of tertiary lesions. The process in the central nervous system would seem to be very similar. Following the initial inflammation, the organisms deposited in the meninges during the period of septicæmia are usually destroyed, but in some cases they remain latent, only rousing to activity after a period of perhaps many years. In other cases relapses occur during the second, third or fourth year of the disease.

The description given above is the ordinary course of the syphilitic infection as seen in untreated or poorly treated cases. The character of the picture may, however, be entirely altered by the institution of intensive treatment. It has long been observed that cases of primary syphilis, relapsing after unsuccessful attempts at abortive treatment with mercury, were apt to show very severe skin lesions. Similar observations have been common in the relapses following inadequate treatment with salvarsan; the skin relapses are apt to be severe and ulcerative lesions are frequently seen in the first year of the infection. The explanation of this phenomenon is probably the failure of development of the natural defensive mechanism of the body, owing to the rapid destruction of the main mass of the infecting spirochætes. The prolonged contact between parasite and host necessary for the development of the altered tissue reaction has thus been prevented. This phenomenon of increased severity in the relapsing lesion, which is seen in the skin, occurs also in the central nervous system. Soon after the general introduction of salvarsan, reports began to appear of suddenly occuring paralyses of cranial nerves, especially the auditory, in patients who had received salvarsan. Many such cases have now been observed. They were looked upon at first as evidences of a neurotropic action of the drug. We now know that these nerve lesions are not caused by salvarsan, but are the result of active syphilitic meningitis with involvement of the nerve trunks in the process. The careful and extensive observations of Gennerich[10] seem best to explain the mechanism of their development. They occur only in inadequately treated cases of early syphilis. In these patients the main mass of the infecting agent has been destroyed by the remarkable spirochæticidal action of salvarsan; this has, moreover, been accomplished so rapidly that no immunity to the disease has developed in the individual. A small focus of spirochætes which, safely tucked away in the tissues of the central nervous system, has escaped the action of salvarsan, can, therefore, develop in the susceptible host with great rapidity and severity. The spinal fluid of these cases of nerve relapse show very remarkable alterations. The cell count is always high and may be enormous, in one of our cases more than one thousand cells per cubic millimetre. The number of cells in the spinal fluids of these patients which is, as a rule, as great or greater than that seen in tuberculous meningitis, shows clearly how active is the inflammatory process in the meninges. The globulin reaction in these fluids is also positive and nearly all show a strongly positive Wassermann reaction. The Wassermann reaction in the blood is, however, frequently negative. This, then, is the result which frequently follows inadequate and inefficient treatment of early syphilis with salvarsan. The infection still persists and the conditions for the development of a latent meningeal focus may then be more favourable than if the patient had remained entirely untreated, since the rapid destruction of the main mass of the infecting organisms has led to an inhibition of the development of the natural defensive mechanism of the body. Such unfortunate results are not infrequent in patients with early syphilis who have received two or three injections of salvarsan and have then been discharged as cured. Fortunately, they can easily be prevented as they never occur in adequately treated cases. The brilliant results which can be attained by the intensive abortive treatment of early syphilis are well illustrated by the experience of Gennerich,[11] who in the past four years has seen twenty cases of re-infection, which, in the light of our present knowledge, is usually regarded as absolute proof of cure. To obtain uniformly successful results, the minimum amount of treatment which can be permitted in cases of early syphilis is two courses of salvarsan, each consisting of six injections at weekly intervals, combined with two courses of twelve to fifteen intramuscular injections of an insoluble preparation of mercury, a period of not more than four weeks being allowed to elapse between the courses of treatment. It is to be remembered that the object to be achieved is not only the healing of lesions, but also the complete elimination of the infection. Our present criteria of efficient treatment are the return to health of the patient, the presence of a negative Wassermann reaction persisting for at least two years after discontinuing treatment and showing no positive phase following provocative treatment, and the presence of a normal spinal fluid. Too much stress cannot be laid on the last of these conditions. Every patient with syphilis should be lumbar-punctured and all showing abnormal cases findings should be treated until these become and remain absent.

The early infections of the nervous system have been emphasized and discussed at length because of their seeming importance. This importance arises from two very different causes; first, owing to the unfortunate misuse of salvarsan and the consequent occurrence of the type of cases described above, this invaluable remedy has been severely criticized in some quarters and the benefits which may be achieved by its proper use have thus been seriously curtailed; secondly, from the point of view of prophylaxis of the late disastrous lesions of the central nervous system, a proper understanding and control of the infection in the early stages would seem to be of utmost importance. The best treatment of tabes and paresis will always be their prevention.

Let us now consider more briefly the later stages of the syphilitic process in the central nervous system. Following the disturbances of the secondary period there usually occurs a long period of latency in which the patient remains entirely free from symptoms, and then gradually or suddenly the evidences of a late nerve lesion make their appearance. This period of latency possesses great clinical interest and importance. An active inflammatory syphilitic process can apparently proceed in the central nervous system over a period of years and cause only the most trifling physical signs or symptoms. If one carefully interrogates patients with central nervous system syphilis, one cannot but be impressed with the frequency with which a history of trifling but quite characteristic symptoms precedes the real onset of the illness. Neurasthenia, fatigue, gastric disturbance, hyperæsthesia to cold, occasional diplopia, are symptoms which frequently precede by years the onset of tabes dorsalis. Nonne[12] has reported four patients with fixed dilated pupils as their only evidence of syphilis; after periods of from ten to fifteen years, during which no other signs of nervous syphilis were apparent, all four developed either tabes or paresis. The frequency with which strabismus or diplopia or the onset of deafness occurs as the first sign of cerebral syphilis is well known; they may precede by years the onset of the disabling symptoms. The absolute necessity of a thorough realization of the seriousness of these premonitory signs and symptoms cannot be too strongly emphasized. Examination of the spinal fluid in these patients will show the evidences of an active syphilitic process, and institution of adequate treatment at this stage will prevent the occurrence of the later disastrous destructive lesions of the brain and cord.

The advent of salvarsan has altered entirely our ideas of treatment of the late nervous manifestations of syphilis. While under the older forms of treatment marked improvement frequently occurred in the group of cases classified under cerebral syphilis, complete cessation of the active process was rarely attained and in the majority of patients relapse subsequently occurred. These were the favourable cases; in the great group of patients with so-called parasyphilis, it was the opinion of many of the best observers that antisyphilitic treatment did actual harm.

Soon after the introduction of salvarsan, reports on the use of this drug in the treatment of central nervous system syphilis began to appear. Remarkable results were seen from the beginning in most cases of cerebral and spinal syphilis, but at first the results obtained in the treatment of tabes dorsalis and of general paresis appeared discouraging. As further observations have been made and as knowledge of the amount of salvarsan which can be safely given has increased, this opinion has, however, been reversed, and almost all observers now agree that well marked improvement may result in tabetics from treatment with salvarsan. In 1911 Dr. Swift and I[13] began an investigation of the effect of intraspinal injections of serum in patients with tabes dorsalis. The serum used was obtained by bleeding the patient shortly after intravenous injection of salvarsan. A method embodying the same principle has been described independently by Marinesco[14] and by Robertson[15] and was used by them in the treatment of a few cases. The technique of intraspinal injections of serum as described by us has since been quite extensively employed by a number of other observers, the concensus of whose opinion seems to uphold our original claims as to the value of the method, and it would now appear that in this method we have an additional means of attack in obstinate cases.

In considering the results of treatment in tabes dorsalis, it must be clearly remembered that, while in cerebral syphilis signs and symptoms frequently arise from a mere mechanical disturbance of function of areas about the lesion, in tabes dorsalis the physical signs of the disease are almost always dependent on actual destruction of the affected nervous tissue. Repair in this tissue is impossible, and, however efficient our treatment may be, we can never expect a restoration of parts destroyed. The goal of attainment which we must therefore set before us should be the arrest of the degenerative process. To do this we must remove the cause, that is, the syphilitic infection. The standard of adequate treatment must, therefore, be not five or ten or twenty injections of salvarsan, nor a certain amount of symptomatic improvement or lack of improvement in the patient, but the removal from the patient of all evidences of active syphilis; that is, treatment must only be considered adequate when we have obtained (1) an arrest in the progress of the disease, (2) a negative Wassermann reaction in the blood, and (3) a normal spinal fluid. With the accomplishment of this result there will occur in the patient in practically every case well marked subjective improvement with diminution or complete cessation of pain, and improvement in general health and spirits.

For the attaining of this end the following scheme of treatment appears, from our present experience, desirable: Before instituting treatment the spinal fluid should be examined and the number of cells, intensity of globulin and strength of the Wassermann reaction noted. A preliminary course of mercury or mercury and potassium iodide is probably advisable in many patients, as it will frequently prevent the occurrence of local Herxheimer reactions. Salvarsan may then be given in courses of six to eight intravenous injections, each of 0·5 gm. At the end of such a course the spinal fluid should again be examined to determine the exact effect of treatment. If satisfactory improvement has occurred, the salvarsan or in robust individuals salvarsan and mercury may be continued. If the improvement has been unsatisfactory, the institution of intraspinal treatment is probably advisable. In patients in whom the disease is rapidly progressing or where vital structures appear endangered, the use of combined treatment from the beginning may be advantageously undertaken.

No absolute rules can be laid down as to the length of period over which intravenous injections of salvarsan may be continuously administered. This varies with the susceptibility of the individual patient. It has been possible in some patients to treat them every other week for a year without unpleasant symptoms developing, but such intensive treatment is only called for in rapidly progressing cases which are not responding promptly to treatment. Usually it is advisable to give from four to six weeks rest after each course of six to eight injections, the individual injections being given every other week. Such courses may be continued indefinitely.

In treating the condition of tabes or paresis the slow disappearance of the abnormal constituents in the cerebrospinal fluid should not be cause for discouragement. If one remembers that one does not hope to cure a patient with early secondary syphilis in less than six months to one year of continued intensive treatment, we should not expect to cure syphilis in a patient in whom the disease has been firmly established for from ten to fifteen years without a correspondingly greater effort. This effort is most certainly justified if we can obtain thereby a permanent arrest of the malady in a patient who has previously considered himself to be suffering from a progressive incurable disease.

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At a meeting of the executive council of the Canadian Association for the Prevention of Tuberculosis, held at Ottawa, Senator J. W. Daniel, of St. John, New Brusnwick, was elected president of the Association in succession to the late Colonel J. H. Burland. The next annual convention will take place in Vancouver on July 5th.

PYELITIS AS A COMPLICATION OF PREGNANCY AND THE PUERPERIUM

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DURING the past year we have had the opportunity of observing a number of cases in which pyelitis complicated the course of pregnancy or of the puerperium. Of late this subject has been studied by many observers, and records go to show that it is of much more frequent occurrence than was formerly supposed. It is a condition which, if not carefully looked for, is easily missed, but which, when the possibility of its presence is recognized, can be diagnosed with the utmost certainty.

To a consideration of some of the points in the ætiology, symptomatology and treatment, I should like to direct your attention, in the hope that we may hear the experiences of those who have had opportunities of observing cases, and that, by calling attention to the frequency of the condition, some help may be given in the recognition of cases which you may be met with in future.

Most of the text-books on obstetrics make but short reference to pyelitis. Yet we have had an opportunity of observing ten cases during the past year at the Toronto General Hospital. These were all fairly severe cases, calling for hospital treatment. There must be a considerable number of minor degree which never reach the hospital wards.

First, as regards the period of onset of symptoms, we have observed cases occurring in the third, fourth, sixth, seventh and eighth months, and post-partum. As a general rule the initial symptoms occur during the latter half of pregnancy, but in some cases before that time.

The nature and the severity of the initial symptoms vary considerably. Sometimes the onset is insidious, sometimes acute. As a rule the first symptom is pain referred to the abdomen, at first not definitely localized, and often accompanied by nausea and vomiting. Bladder symptoms, in the form of frequent and painful micturition, may or may not be present. In my experience they are frequently absent. The temperature is usually raised one or two degrees, and the pulse rate increased. In some cases the disease is ushered in with a distinct rigor and a temperature of 103° or 104°. Usually in the course of a day or two the pain becomes more definitely localized to one or both renal regions, more usually the right. In other instances the onset is more insidious, beginning with malaise, slight lumbar pain, and slight elevation of temperature. In still others, bladder symptoms may be prominent from the beginning, and a diagnosis of cystitis be made. Later renal symptoms manifest themselves. These may be cases where the infection is an ascending one from the bladder.

At first there may be little or no pus detected in the urine macroscopically, but a microscopic examination practically always reveals the presence of pus cells and of organisms, and these latter can be grown on culture media.

From the beginning there is usually quite distinct renal tenderness, elicited on deep palpation, and this in my experience is a sign on which great reliance can be placed. The kidney is not always distinctly palpable, especially in the acute stages, when the abdominal muscles are sometimes boarded. In the ordinary case there is never any great enlargement of the organ.

On vaginal examination there is usually, but not invariably, distinct tenderness on palpating the bladder through the anterior fornix, and often the ureter on the affected side can be felt as a distinct cord running round the lateral fornix towards the bladder. It is usually distinctly tender.

Cystoscopic examination may reveal the presence of cystitis. The affected side is indicated by the pouting and redness of the corresponding ureteral opening, and by the flow of turbid urine from it. Catheterization of the ureters establishes the diagnosis.

Differential Diagnosis. In the cases with definitely localized renal pain, bladder symptoms and pus in the urine, the diagnosis presents little difficulty. Still, many of those cases have been missed in the past simply from a want of knowledge of the frequency with which the condition is present in pregnancy. In cases where the onset is acute, with severe generalized abdominal pain, nausea and vomiting, distension of the abdomen, high temperature and quick pulse, the differential diagnosis is more difficult. I believe this condition of pyelitis to be so common in pregnancy that when a pregnant woman presents those symptoms it is the first thing I think of, and with this in mind it is usually possible to make a definite diagnosis from other acute abdominal conditions. Many such cases have been diagnosed in the past as appendicitis, perforated gastric ulcer, intestinal obstruction, empyema of the gall-bladder, and so forth, and operations undertaken without, of course, any relief. A patient with pyelitis has not the typical abdominal look, with drawn face and anxious expression, which is so constantly present in those other conditions. A careful examination of the abdomen will show the tenderness to be most marked in the renal region, so that it can be elicited by pressure from behind over the lower ribs. Examination of a catheter specimen of urine reveals the presence of pus cells and of organisms, usually B. coli. Careful inquiry into the nature of the pain often elicits the fact that it tends to radiate downward towards the urethral orifice. If there is still doubt a careful cystoscopic and ureteral examination will usually clear the matter up.

In most of those acute cases there is a distinct leucocytosis. In my own series it varied from 10,800 to 18,000; and this is what is usually met with.

When the case begins acutely with distinct pain in the renal region, often increased on deep inspiration, the condition has to be differentiated from a pleurisy or pneumonia. This may not be easy in the initial stages, but usually in the course of twenty-four or forty-eight hours it can be recognized. What may be termed the chronic cases, with somewhat indefinite lumbar pain, slight elevations of temperature and general malaise, may be easily missed unless a careful palpation of the renal region be carried out, and a microscopical and bacteriological examination of the urine made.

When the condition arises in the puerperium a differential diagnosis from other forms of bacterial invasion must be made.

Before saying something about treatment let us look for a little at the explanations offered to account for the frequency of pyelitis as a complication of pregnancy. The connexion between pyelitis and pregnancy was first pointed out by Bayer. It is, of course, not a disease peculiar to pregnancy, but pregnancy appears to be in some way or other a determining factor in its production and various theories have been advanced to account for this. In the first place we must remember that pyelitis is more frequent in the female than in the male, and this applies to children as well as to adults, as pointed out by John Thompson and others. We also know, from clinical experience, that cystitis is much commoner in the female than in the male. This is due to the shortness and the large size of the lumen of the female urethra, and to its proximity to an area whence B. coli can readily reach it. This organism has been demonstrated in the urine of women with no symptoms of cystitis. Leith-Murray, Williams and Wallace found coliform organisms in one-third of normal female urines. The specimens were obtained by intraperitoneal puncture of the bladder, thus avoiding urethral contamination. In only 2 per cent. of normal cases in men have these organisms been found. Engelhorn examined the urine of thirty-five pregnant women, and found it sterile in only fourteen. In ten only of the twenty-one cases in which it was not sterile were there symptoms of cystitis. Opitz, in a systematic bacteriological examination of one hundred and sixty cases of pregnancy, found bacteria in the urine of two-thirds of them, pyuria in only one-fifth. The commonest organism was the B. coli. Weibel, in an examination of one hundred pregnant women, found in contrast to other writers that the colon bacillus was less often met with in the bladder and urethra than other organisms.

There are thus possibilities of organismal infection of the pelvis of the kidney if ascent of those organisms can occur. It is generally conceded that an ascending infection from bladder to pelvis does in some instances occur, not probably along the mucosa of the ureter, but rather through the lymphatics in its wall. This ascent is favoured by dilatation of the ureter from any cause, and consequent stagnation of urine. Such conditions are found in the course of pregnancy. Post-mortem examination of women dying in the later months of pregnancy shows that in a considerable number there is dilatation of the ureters. Olshausen found it in twenty-five out of thirty-four pregnant women, Lohlein in eight out of thirty-two, Polak in thirty-five out of one hundred and thirty. This dilatation is more common on the right than on the left side, due possibly to the right obliquity of the pregnant uterus, and consequent pressure of the right ureter by its right border. In conjunction with this we find that right-sided is much commoner than left-sided pyelitis.

Dilatation of the ureter and stasis have been demonstrated clinically by means of *x*-ray pictures taken after the injection of collargol into the renal pelvis. Weibel found it in sixty-two out of one hundred pregnant women whom he examined in this way. In thirty-three of these there was obstruction to catheterization: in seven at the ureteral orifice, and in the others in the pelvic portion, within 15 cm. of the bladder. Obstruction may be due to muscular spasm, or to flexing and bending in the course of the ureter, swelling of the mucosa, displacement and bending by the large uterus, dislocation and change in shape of the bladder by the uterus and fœtal head.

But, granting that ureteric dilatation is an ætiological factor in the production of the disease, it does not follow that the infection is always an ascending one from the bladder. Such dilatation, with stagnation of urine, favours the invasion of the kidney and ureter by organisms carried in the blood stream, or conveyed by the lymphatics from other organs, such as the intestine. It is held by many observers that the two latter are the commonest routes of infection. Hess, experimenting on rabbits, found that he could induce a pyelitis by ligation of the ureter, and the introduction of B. coli into the blood stream.

Conditions favouring the invasion of the lymphatics or blood stream by the B. coli during pregnancy are the frequency of obstinate constipation, and very often the lowered resisting power of the patient, owing to a subacute toxæmia. It is not uncommon to find albumin and casts in the urine of those patients. They were present in four of my cases, and in one there was such a degree of toxæmia as to necessitate termination of the pregnancy.

Franke found that animals treated with opium showed coli bacteria in the mesenteric lymphatic glands in four to five days after, although they had not complete intestinal obstruction. He has shown that the lymphatic vessels of the ascending colon and cæcum pass to the capsule of the right kidney. The direction of the current is from the intestine to the kidney. Stahr has found lymphatic connexions from the capsule of the kidney to the kidney itself, so that the connecting chain from the mucous membrane of the large intestine to the kidney substance is complete. The ascending colon has a short mesocolon, which on distension of the intestine is unable to cover its whole circumference, so that its posterior surface has a space free from peritoneal covering. On the left side the descending colon is much more movable, has a longer mesocolon, and when completely distended is still covered by peritoneum, so that on this side the serosa-free surface of the intestine does not lie anywhere upon the kidney, its pelvis or the ureter. The significance of this, the nearness of the cæcum and the more frequent occurrence of pyelitis on the right side has been pointed out by Mirabeau. He found that it is coli infection only which prefers the right side. This, when considered in connexion with the anatomical relations, is in favour of the lymphogenous origin of the condition or of direct transition from the intestine.

Nature of the Infecting Organism. In the great majority of instances the infecting organism is one of the coli group. It was present in all of my cases, in pure culture in eight, associated with a Gram-positive diplococcus in one, and with a staphylococcus in another. Bacteriological examination of those last two cases showed a pure culture of B. coli in the later stages. Williamson and Barrie described a fatal case where the B. paratyphosus was obtained in pure culture from the right kidney. There were abscesses throughout the kidney cortex, indicating a blood infection. Swift found the B. coli in pure culture in seventeen cases which he examined. Louria, in addition to the B. coli, found staphylococcus albus, streptococcus and gonococcus present in some cases. Von Albeck found the B. coli in pure culture in seventy-six out of ninety-two cases of pregnancy pyelitis. The possibility of a tuberculous infection must of course not be overlooked. In one of my cases the patient was suffering from phthisis, but the infecting organism in the urine was the B. coli. In a case with a considerable amount of pus in the urine the organism is almost certain to be B. coli if the reaction is acid. A pure tuberculous infection will, of course, give the same reaction.

Treatment. Fortunately, although at the onset the symptoms may be very alarming, the condition is usually amendable to medicinal treatment, and only in rare instances does the pregnancy require to be terminated, or the kidney interfered with surgically. There are four main lines along which treatment may be directed: (1) Adminstration of urinary antiseptics; (2) the administration of alkalies in cases of B. coli infection; (3) the use of vaccines; (4) catheterization of the ureter and the flushing out of the pelvis of the kidney, or the application of some germicide to it.

In the cases which I have located good results have followed from the use of one or more of the first three methods. In none have we had to resort to the fourth. In the first instance a urinary antiseptic is usually administered, and I have found urotropin the most effective. From a study of the literature this seems to be a very general experience. It is generally given in doses of 10 grains thrice daily, and may be combined with 20 minims of tincture of hyoscyamus if there is bladder irritation. Meantime a careful examination of the urine is made, its reaction determined, and the organism identified. If the latter is in pure culture a vaccine is made. If the reaction of the urine is acid, and no improvement results from the urotropin, the latter is discontinued, and the administration of potassium citrate begun; 15 grains every four hours are given at first, and this is increased by 5 grains at a time until the urine is alkaline at the time it is voided. In some cases it is necessary to give as much as 30 or 40 grains every four hours before this can be effected. Usually when alkalinity has been established the patient begins to improve. If not, the autogenous vaccine, which has been prepared, is given, the initial dose being usually 100 millions. This is repeated every four or five days, the subsequent doses being of 200 millions.

I know of no way by which one can tell beforehand which of those three methods is likely to succeed in any particular case, and I adopt them simply as a matter of convenience and in order to save time. The only disadvantage of urotropin that I have seen is that it occasionally produces strangury, where previously no bladder symptoms had been present.

If there is not a marked improvement by one or other of those methods a cystoscopic examination ought to be made, and the affected ureter or ureters catheterized. The pelvis of the kidney can then be gently flushed with normal saline or a 1 per cent. solution of silver nitrate, or 25 per cent. argyrol applied. The catheter may be allowed to remain in the ureter for some hours to facilitate drainage.

In all cases the diet should be a bland one, quantities of fluid should be drunk, absolute rest in bed must be enforced, and the semi-prone posture on the side opposite to that affected maintained. Purgatives should be freely given.

It is only after a thorough trial of the preceding methods without result that interrruption of the pregnancy should be considered. When this is resorted to rapid improvement usually follows.

Some cases go on to the production of pyonephrosis and pyelonephritis. In such some operative procedure must be carried out, either incision and drainage or complete removal of the affected organ.

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THE EARLY DIAGNOSIS OF GASTRIC CARCINOMA

A Comparison of Clinical and Roentgen Methods

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CANCER of the stomach to-day presents itself as a horrible reproach to the medical profession. Many thousands are dying annually of this disease, and it still continues to be the most deplorable condition of the digestive tract, in spite of our wonderful modern surgery, and in spite of the refinements of physical diagnosis.

It is recognized to-day that the only hope for the future lies in surgery applied early enough before there is much local extension, and before there are any metastases. Time and time again we have heard the late Maurice Richardson make the statement that 85 per cent. of his inoperable cases of gastric cancer might have been cured by operation if it had only been done early enough. Early operation, however, means early diagnosis; and here is where the difficulty lies. The ability to use our modern surgery effectively depends entirely upon pushing the present limits of diagnosis farther back.

The old criteria upon which the diagnosis of cancer of the stomach was based, namely, twenty-four hour food stasis, blood, and a palpable tumour, are quite worthless so far as the effective application of surgery is concerned. The cancer here is practically inoperable—at least all that can be done is to relieve symptoms of obstruction by a palliative operation; or in some extremely favourable cases partial resection may stay the progress of the disease for a while.

Even with more refined clinical diagnosis, with the recognition of micro-retention, decrease in acidity, presence of lactic acid and Oppler-Boas bacilli, and occult blood in the stools,—when all these are found, the clinical diagnosis is perhaps early but the cancer is not. By the time it is recognizable by these methods, it is already late, and the question of radical cure is very doubtful.

Read at the annual meeting of the Canadian Medical Association, St. John, N.B., July, 1914. The paper was illustrated with lantern slides.

The newer methods of chemical examination of the stomach contents, such as the glycyl-tryptophan test and the phosphotungstic acid reaction of Wolff, give results which are unstable, and upon which no firm foundation can be laid. The same is true of the present status of the serum tests for cancer, such as the hæmolysis test and the modified Abderhalden reaction. Even if positive, the latter give no hint of the location of the trouble.

In short, the situation to-day as regards the possibility of making a reasonably early diagnosis of gastric cancer from clinical data alone is practically hopeless. Only two weeks ago, Smithies, of Chicago, in a paper before the American Association of Gastroenterologists, at Atlantic City, stated that there was no one dependable sign on which to base the diagnosis. All this, however, refers to the usual methods of gastro-intestinal study.

With the Roentgen ray, on the other hand, we have a means at our command which we believe has already shown itself to be of distinct value in detecting early carcinoma. We do not mean to infer that the method is to-day an absolutely positive one, or that every case can be detected in its incipiency; but we do wish to state emphatically that we are already in the possession of certain evidence which pushes the limits of diagnosis much farther than can be done to-day by any other methods of examination.

The Roentgen diagnosis of gastric carcinoma is of two sorts. First, there is the early recognition of what may be called advanced or latent carcinoma. These cases show rather extensive filling-defects in the bismuth mass, with characteristic gross irregularities. Such cases are often missed clinically, even with careful gastro-intestinal examination, because they may not cause obstruction; indeed they may produce hypermotility. This sort of Roentgen diagnosis, while interesting and settling matters for the patient, does not really help very much, because this type of case is not early enough to give hope of a radical cure.

The other kind of Roentgen diagnosis is what we may call the early diagnosis of early carcinoma. This is the diagnosis that is of real value both to the patient and to the surgeon. Here we have distinct hopes of detecting the cancer early enough to obtain radical cure by the surgeon. This is the type of lesion that gives very few and obscure gastric symptoms. There is usually no obstruction; the acidity may be practically unchanged; there is, of course, no lactic acid; and there may be no blood in the gastric contents or stools. The data upon which even an exploratory operation could be advised are therefore very slight.

These lesions are usually quite small, and are situated at the pylorus, or rather just pre-pyloric. They may be primary cancer, or the result of malignant degeneration of old ulcer. The extension of growth from the pylorus is usually along the lesser curvature.

The method of Roentgen examination in these cases is extremely important. The fluoroscope, while of some value in this connexion, should by no means be depended upon exclusively. These lesions are so small that their direct detection upon the fluoroscopic screen is in the majority of cases impossible. The screen study of the indirect manifestations, such as hypermotility, lack of peristalsis, antiperistalsis, etc., while important, certainly does not warrant any positive diagnosis, and is apt to lead to many errors. In other words, the cases of carcinoma of the stomach that can be detected on the fluoroscopic screen are more apt to be the late cases or the moderately advanced ones. The diagnosis of the very early pre-pyloric lesions with the fluoroscopic screen is in our opinion usually only inferential, and is dangerous. The chief danger is in missing lesions that could be detected by other methods of Roentgen examination.

The only safe method of diagnosis is by the direct demonstration of the lesion upon plates. The lesion consists of a defect of filling, usually very slight in size, at or before the pylorus. This defect is usually annular in character, resembling often a great elongation of the pyloric gap. The annular quality distinguishes these lesions from the ordinary chronic ulcer in this region. Just why these lesions should give this annular defect, we do not exactly know. It is barely possible that the extension of the cancer cells through the lower layers of the stomach wall affects the contractility so as to exaggerate the defect and give the annular appearance. Of course, this is pure speculation.

The characteristic defect must be seen on a number of plates, although not necessarily a very large number. It is advisable to confirm the presence of the defect at another stomach examination, usually made after the twenty-four hour plate. It is especially important to show the defect on the lateral view of the stomach, as this disposes definitely of the problem of pressure.

Of course, the problem of the malignant degeneration of old ulcer is always present here. Our work in this region has led us to the conclusion that whenever we find this irregular, annular defect, radical surgery should be urged. By this we mean real resection of the lesion, if it is surgically possible, and not the mere palliative operation of gastro-enterostomy. Of course resection will depend upon the mobility, lack of adhesions, absence of liver metastases, etc. However, the difficulty in getting a resection performed is in the case which surgically offers no contraindications. In these cases, it is the surgeon's judgement that the lesion is probably chronic ulcer, and he does nothing more than a gastro-enterostomy. He believes that the possibility of cancer is less than the added risk of resection.

With those lesions, however, which give definite Roentgen signs of probable or possible malignancy, we believe no surgeon has the moral right to deny his patient the chance of cure that is afforded by resection. The decision of malignancy should not be allowed to rest with the surgeon, who only has external inspection and palpation to guide him. The radiologist has, in addition, the evidence derived from the mucosal side of the stomach. The sole judge of the case should be the pathologist, after he has examined the microscopic sections from the excised lesion.

We feel very strongly about this matter, because of several cases that have taken place in our own practice. Certainly as radiologists we have the moral right to urge radical surgery in such cases as present the least suspicious evidence of malignancy. In this way only will enough data be accumulated to strengthen the early diagnosis in the future; and only in this way, by excision, can the problem of early gastric cancer be solved.

Summary. The best clinicians to-day are agreed that the real early diagnosis of gastric carcinoma is hopeless with clinical methods alone.

With the Roentgen method properly applied we are sure that we have one means at our disposal that will enable us to detect the cases when they are still amenable to surgery.

The lesions are small and located near the pylorus, showing small filling-defects, annular in character.

With such findings present, the radiologists should urge resection, as only in this way can diagnosis be helped, and the problem of gastric cancer be solved.

THE BOAS-OPPLER BACILLUS (LACTIC ACID BACILLUS), AND THE DIAGNOSTIC IMPORTANCE OF ITS PRESENCE IN THE GASTRIC CONTENTS

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IN 1886, Du Barry reported some cases of carcinoma of the stomach which had been observed in Kussmaul's clinic, in which rod-shaped immotile bacilli were demonstrated in the gastric contents. These were probably a growth of the microörganism now known as the Boas-Oppler bacillus.

Boas is generally recognized as being the first to connect the presence of these microörganisms in the gastric contents with cancer of the stomach. In 1892 he described the microscopical characteristics of the bacillus, and pointed out its importance in diagnosis. Subsequently, in 1895, a more accurate investigation was made by Oppler, but neither he nor Boas succeeded in obtaining a pure culture of the bacillus. This was accomplished shortly after (1895) by Schlesinger and Kaufmann and Strauss, the two former employing a medium of glucose agar, and the latter one of fresh peptone agar. More recently R. Schmidt has contributed a considerable amount of information in regard to the recognition of the bacillus and its differentiation from other organisms which occur in the gastric contents and fæces, and the appearance of which is somewhat similar.

The Boas-Oppler bacilli are rod-shaped bacilli, varying in length from three to fifteen microns, and usually about one micron in thickness. They are immotile, do not form spores, and frequently join one another in angles. They stain with methylene blue and with Gram's solution. With Lugol's solution the bacilli stain brown, which character distinguishes them from the leptothrix of the mouth, as the latter microörganism shows a blue or violet stain with this reagent. The name of lactic acid bacilli, which is frequently given to the growth, is a very appropriate one, as they possess the power of coagulating milk and forming lactic acid from various kinds of sugars. The detection of lactic acid is therefore of value in the diagnosis of carcinoma of the stomach, as an abundant growth of Boas-Oppler bacilli is invaribly associated with lactic acid in the stomach contents. If only a few of the bacilli are present, however, the quantity of lactic acid produced may be too small for detection by the ordinary clinical tests. It is evident therefore that in the hands of the majority of clinicians the microscopical test is more delicate than the clinical.

Let us now consider the clinical significance of the finding of the Boas-Oppler bacilli in the gastric contents.

Judging both from my own experience and that reported by others, I should say that in more than 70 per cent. of the cases in which these bacilli are found in the gastric contents cancer of the stomach is present. In view of the fact, therefore, that excision of a cancer of the stomach in its early stage renders a cure possible, it is evident that the detection of an abundant growth, or even of a fairly large number, of Boas-Oppler bacilli, should suggest carcinoma of the stomach, and if the sign is accompanied by other manifestations of gastric cancer an indication for surgical treatment exists, provided the condition is not so far advanced as to render the case inoperable. It occasionally happens that an operation, in cases in which cancer is suspected on account of the presence of the Boas-Oppler bacillus, does not reveal its existence. Such exceptions to the general rule, however, do not affect the principle, as one cannot afford to take any risks in dealing with cancer of the stomach. Moreover, even if a malignant growth is not discoverable, the surgeon usually finds some benign condition which requires surgical treatment. I will here give notes of a case of this kind, which recently came under my observation.

F. W., aged forty-two, consulted me in May, 1914, on account of sensations of pressure and gnawing in the gastric region, associated with occasional attacks of vomiting. The patient had been ill for the previous six months, and had lost twenty-five pounds in weight. A skiagram of the stomach immediately after a barium meal showed nothing abnormal. An analysis of the gastric contents after a test meal gave free hydrochloric acid 1·5, and total acidity 36. An examination of the sediment showed the presence of Boas-Oppler bacilli in some of the microscopical fields, six being present in one of them. Owing to these symptoms and signs, I came to the conclusion that the case was probably one of cancer, and the patient was accordingly referred to my surgical colleague, Dr. Primrose, who found on operation adhesion of the ileum near the ileo-cæcal valve (Lane's kink), but apparently no disease of the stomach. After removal of the obstruction the patient made a complete recovery.

In this case it is only rational to assume that a suitable pabulum for the growth of the Boas-Oppler bacilli must have existed, and that intestinal stasis and hyposecretion of gastric juice were factors in its production.

The question may be asked: In what proportion of cases of cancer of the stomach are Boas-Oppler bacilli present in the gastric contents? It may also be asked why they are so common in the gastric contents of cases of gastric cancer?

In answer to the first question I may state that I am not in a position to give any definite data. There is no doubt that in many cases of cancer of the stomach the bacilli are never present in the gastric contents at any time during the course of the disease. I have records of advanced cases, both with and without free hydrochloric acid, in which the Boas-Oppler bacilli were absent. The presence or absence of the bacilli appears to depend a great deal upon the stage of development and position of the cancer, as well as on the state of gastric secretion. The results of my experience indicate:

1. That the bacilli are present in the great majority of cases of cancer of the pylorus in which there is absence of free hydrochloric acid in the gastric contents.

2. That the bacilli are frequently present in malignant ulceration of the stomach, in which there is absence of free hydrochloric acid in the gastric contents, and that this may be so either in the presence or absence of pyloric obstruction.

3. That in a considerable proportion of cases of gastric cancer in which a small amount of free hydrochloric acid is present Boas-Oppler bacilli are found.

The question as to the reasons for the frequency of Boas-Oppler bacilli in the gastric contents in cases of cancer of the stomach remains to be discussed. We have already referred to the fact that absence of free hydrochloric acid in the gastric contents is very common in cancer, and there is no doubt that this secretory disturbance is an important factor in the development of the bacilli. Most of the cases in which they are present are also characterized by the absence of free hydrochloric acid, the absence of free hydrochloric acid is not, however, sufficient in itself to explain the presence of the Boas-Oppler bacilli for this secretory disturbance is also a sign of achylia and chronic asthenic gastritis, maladies in which the lactic acid bacilli are rarely found. I have records of gastric analyses of one hundred and five cases of these diseases and in only two were the bacilli found. Moreover, these two were not simple cases of gastric disease, as one was complicated by ascites due to syphilitic cirrhosis of the liver and the other by intestinal obstruction. It is evident that in most cases of gastric cancer in which the lactic acid bacillus is present there is a factor which acts in conjunction with absence of free hydrochloric acid in bringing about the growth of the microörganism.

Pyloric obstruction is a factor in bringing about a growth of the bacilli in the stomach, as it is also in favouring the development of sarcinæ and other microörganisms. This is quite a natural result of stagnation of food. There is, however, no doubt that the reason why the Boas-Oppler bacilli are so common in cancer of the pylorus is that the pyloric obstruction is, in most cases, associated with absence of free hydrochloric acid in the gastric juice. If the pyloric obstruction is accompanied by hypersecretion or hyperchlorhydria, as occurs so frequently in benign ucler of the pylorus, sarcinæ are commonly found in the gastric contents, whilst Boas-Oppler bacilli are somewhat uncommon. The finding of sarcinæ without lactic acid bacilli is not, however, conclusive evidence of the existence of benign obstruction of the pylorus, because this is the microscopic finding in a small proportion of cases of pyloric cancer. If both lactic acid and sarcinæ are present the pyloric obstruction is more likely to be malignant than benign.

In my own experience the association of sarcinæ and Boas-Oppler bacilli in the gastric contents in cases of cancer of the pylorus has been somewhat common. The clinical histories in such cases, however, have invariably indicated that the cancer was consecutive to ulcer. The presence of both microörganisms in the gastric contents should, I think, always suggest this type of cancer. It is quite possible that the condition may prove to be non-malignant, but in my experience such a result has been exceptional. As a rule in the stage previous to the engrafting of the cancer upon the ulcer sarcinæ are present and Boas-Oppler bacilli absent. As malignancy develops there is often a diminution in the percentage of free hydrochloric acid in the contents of the stomach, and this diminution is no doubt a factor in favouring the growth of the lactic acid bacilli. I have closely observed and investigated the progress of many cases of this type. Occasionally the growth of lactic acid bacilli sets in without any appreciable change in the gastric secretion. In these cases it is possible that the necrotic and ulcerative changes occurring in the malignant growth may predispose to the development of the bacilli. These latter characteristics should, I think, be looked upon as factors in the development of the microörganism, in all cases of gastric carcinoma. Stagnation of food, due to pyloric obstruction, conduces to the growth but it is not essential, for I have examined many cases of gastric cancer which showed no appreciable disturbance of motor function, but in which there was an abundant growth of the bacilli in the gastric contents. And the absence of free hydrochloric acid in itself, as we have already shown, is not sufficient to account for the presence of the bacilli. How then can we explain the development of the bacilli in cases in which there is no disturbance of motor function? The factor which should, I think, be taken into consideration in endeavouring to find an explanation for the presence of bacilli in these cases is the degenerative changes which are so common in malignant disease. The necrotic and ulcerative processes which are frequently present tend to form at least a nidus, if not a pabulum, for the growth of germs in the absence of stagnation of food. That this is the case is supported by the fact that almost a pure culture of the Boas-Oppler bacillus may be found in particles of necrotic tissue obtained by gastric lavage before breakfast in some cases of malignant ulceration of the stomach.

The third annual meeting of the Quebec Provincial branch of the St. John Ambulance Association was held at Montreal, January 26th. During the year ending October 31st, 1914, twenty-eight classes were held and were attended by 444 students. Certificates were granted to 131 men and 182 women; these included 233 first aid certificates, three junior first aid certificates, eleven home nursing certificates, eight vouchers for examination, three medallions, and two labels. Major H. B. Yates was elected president.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF TUBERCULOSIS

By W. B. Kendall, M.D.

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THE therapy of artificial pneumothorax consists in the immobilization of a diseased lung through repeated injections of a slowly absorbable gas into the pleural cavity.

History tells us that this therapeutic measure first received attention in the early eighties, when Carson, of Edinburgh, suggested that air be introduced into the pleural cavity for the collapse of tuberculous foci in the lung. From 1894 when Forlanini, of Pavia, Italy, first published results, such men as Brauer, Spengler, Murphy, Muralt, and Saugman have been among those particularly interested in the conception and application of this therapeutic measure.

The historical development of this treatment probably originated from the clinical observation that pleuritic effusions, and in some cases even a spontaneous pneumothorax, exerted a favourable influence on tuberculous pulmonary disease.

Pathology. Just as the constant respiratory activity in the chest favours the spread of disease by aspiration as well as through the blood and lymph streams, so does splinting the lung and placing it in a state of rest impede the above means of spreading infection. The dilated lymph spaces and the increased deposition of carbon pigment indicate an obstruction to the flow of lymph, according to Gratz, while clinical evidences of lessened toxæmia, such as falling temperature, after lung compression would lead us to assume that there was an impeded lymph stream and, therefore, less toxic absorption.

Tuberculous cavities show a marked diminution in size, while the anticipated reduction in quantity of expectoration is quite marked. Some interesting findings have also been noted on examining the sputum. In some cases no tubercle bacilli are found, while in most instances a great reduction in number was noted.

Read at the annual meeting of the Canadian Medical Association, July 7th, 1914. A synopsis of twenty-one cases was appended to the paper.

As old cavities are collapsed, fewer secondary organisms are demonstratable. Whether the diminution in organisms is due solely to pressure or to the changed content from air to nitrogen in alveolar and other tissues is difficult to prove.

Tobeisen has examined the air of a pneumothorax. His analytical examination shows an increase of carbon dioxide and a diminution of oxygen which at first takes place rapidly, whilst it takes some time for the oxygen to be absorbed. The amount of nitrogen present he claimed to be almost always 90 per cent. The percentage of oxygen and carbon dioxide varied somewhat.

Kistler states that there is an unmistakable and direct connexion between the pressure exerted by the pneumothorax, and a proliferation of the connective tissue. We know that contraction with cicatrization and fixed cell infiltration are to be found in lesions that have healed spontaneously, but Gratz states that under pneumothorax there is a striking tendency to callus formation in the region of the vessels and bronchi, indicating the healing of perivascular and peribronchial inflammatory processes, and that he regards the anatomical changes in the lung as proof that the tuberculous disease has come to a standstill and is in the process of healing.

Indications for Treatment. The utility of a pneumothorax mainly depends on the degree to which the diseased lung can be compressed or placed at rest. This latter point will be modified by the presence of pleural adhesions, their extent and permanency.

Pleuritic adhesions are never entirely absent in advanced tuberculous lung conditions; some may be easily broken down with slight pressure, while others may be extensive in distribution and rigidly adherent. Unfortunately neither physical nor Roentgen examination gives an absolutely certain indication of the seat and extent of the adhesions. In two out of twenty-one cases we found it impossible to find a free pleural space even after repeated attempts, while in two cases that allowed but slight inflation on the first attempt a fair quantity of gas was injected at the second sitting. One would naturally expect to find less adhesions in the earlier stages of phthisis, and for this reason some advocate the induction of pneumothorax in this class of case. There exists, however, a great difference of opinion as to what class of patients shall be subjected to this form of therapy. Balboni says, "treatment by pneumo-thorax ought only to be resorted to after having given a fair trial to other well-known forms of treatment." Lapham says, "if all else has failed, if symptomatic and tuberculin treatment cannot arrest the process, then the attempt to save the patient by compressing the lung would seem amply justified." Murphy still advocates treatment in the earliest stages. Brauer and Spengler report eighty-eight cases treated in the late stages, while Saugman reports thirty-five cases of the early and non-complicated type.

Our cases have been selected in accordance with the following wide classifications:

> Class I. Strictly unilateral cases (as far as physical signs would indicate) which have been under sanatorium *régime* for at least six months without satisfactory improvement.
>
> Class II. Cases with one lung extensively involved, the other but slightly so and inactive; with the trouble progressive and the prognosis hopeless.

Technique of Thoracentesis. There can be no rule in reference to the site of puncture. The percussion note is probably of most service in trying to select a point. The absence of auscultatory signs of disease will also aid in selecting a spot most free of adhesions. In the majority of our cases a puncture was made in either the fourth or fifth interspace in the mid-axillary line.

The patient is placed on the side, while the site of operation is painted freely with tincture of iodine. Thorough local anæsthesia should be established before a puncture is made, while previous to the initial attempt at locating the pleural space we have always given morphine sulphate gr. $\frac{1}{6}$ and atropine gr. $\frac{1}{150}$ hypodermically. Novocaine 2 per cent. is used as a local anæsthetic and is injected with a long needle, so that each layer of tissue from skin to parietal pleura can be slowly impregnated.

After anæsthesia, a small skin incision is made with a double-bladed tenotome, in order that the blunt injecting needle may more easily pass through the skin and superficial fascia. Care should be taken to pass the needle slowly and to note the resistance presented by each tissue layer. After the pleura is reached the tube from the machine may be attached and the stilette removed. If the needle is properly placed, and adhesions are not present, manometric oscillations should be registered as soon as the parietal pleura is passed.

After oscillations are shown and before gas in introduced we insert a Record hypodermic syringe in the stilette opening of the needle, as a precaution against gas embolism. If blood is shown a new puncture will, of course, be necessary. As an extra precaution against the last-named complication, we also follow Deneke and use oxygen instead of nitrogen for the first 200 c.c. of gas at the initial filling. Never introduce gas into the chest unless free manometric oscillations are present constantly. A slight oscillation may sometimes be noted when the needle is adjacent to but outside of the pleural space. A range of movement from 1 to 4 mm. (water) on the manometer is evidence of lung mobility. Nitrogen should not be run in too rapidly, nor the pressure used too high. While endeavouring to immobilize one lung we are at the same time entailing increased physiological functions on the other. Compensation must be established and be adequate. We are indebted to V. Muralt for important research in reference to manometric measurements of pressure. He regards the exact measurement of pressure as indispensable, since it is an index for the proper carrying out of the operation, while also giving an indication as to refilling. In some of our cases no pressure was registered, while in but two cases was a pressure of 10 mm. (water) exceeded.

Quantity of Nitrogen. It is impossible to give a ruling here; each case must be treated on its merits. In some cases 1000 c.c. can be introduced with ease, while in others pleural adhesions, even if slight, may limit the amount of gas introduced and also lengthen the time of filling.

In two instances patients complained of slight pain in the front of the chest, while two others experienced sharp pain in the shoulder. Some patients spoke of a feeling of pressure in the chest, while the majority when questioned did not seem to note much change. Guides to the pressure should be: (1) the ease with which the pleural space is found, (2) manometric oscillations, (3) pressure readings, and (4) the condition of the patient. Filling should be at once discontinued if the patient complains of pain. Although some writers have noted marked dyspnœa, cyanosis, nausea, etc., after the operation, we have noted no such symptoms.

Frequency of Refills. This will depend on the capacity of the pleural space, and the readiness with which the gas is absorbed. Amounts of gas introduced may also vary as adhesions clear by gas pressure, or through pressure due to coughing, etc. In the average case, using oxygen and nitrogen at the first operation, a refill will be necessary in about four days. The time will then gradually lengthen to from three to eight weeks. Schwatt advocates making small and frequent fillings, as do also Robinson and Floyd, while Klemperer and others advise injecting 700 to 1200 c.c. if possible at the first stiting if the pressure is only slightly positive. Compression must be kept up until permanent results are obtained, Brauer and Spengler stating from one to one and a half years, or from sixteen to twenty refills in all. Saugman prefers to maintain too long rather than too short a period. Forlanini has maintained compression for seven years and obtained expansion of healthy lung after that period.

Changes in Symptoms and Clinical Findings. Time and numbers of cases must be factors in order that results may be correlated. In general the clinical results will depend on the extent of the pneumothorax and the compression obtained. We have found the most striking symptomatic changes to be: (1) fall in temperature, (2) lessened pulse rate with improvement in volume, (3) lessened cough (after the first day or so, during which period it may be more), (4) marked lessening in expectoration after the first two days.

In three cases there has been a betterment shown in the general condition, including increased appetite and a gain in weight, while the other cases have not been under observation sufficiently long to warrant such changes.

We found on examination that the physical findings in the first seven cases varied in accordance with previously existing conditions, and with the extent of compression obtained. Where the alveoli were rigidly compressed no adventitious sounds, pleuritic or intrapulmonary, could be elicited. We could not demonstrate the presence of cavities over the area of pneumothorax where undoubted excavation previously existed.

Apparatus. One type of apparatus which we use and which I am presenting to-day is a modification of that introduced by Forlanini and Saugman. It consists of two 1000 c.c. glass jars, one plain and one marked with a scale from 0 to 1000. These bottles are fastened to a board and are joined by rubber tubing. Between the bottles and fastened to the stand is a manometric tube on a white scale, marked on each side from zero to twenty-five. At the top of one manometer tube is a funnel for filling it with coloured water or mercury, while to the other end is attached the rubber tube leading to the gas tank. The glass jars are half filled with 1 in 5000 bichloride solution. A small glass tube with an absorbent cotton filter is placed between the rubber gas intake tube and the larger marked jar filled with gas. Three glass-ground stop cocks are provided in the course of the tubing: (*a*) a double one leading from the filling tube to the manometer and the jar containing gas, (*b*) one to close off the manometer when filling the jar with gas, and (*c*) one at the top of the unmarked glass cylinder to allow air to escape when filling with gas.

Complications and How to Avoid Them

1. GAS EMBOLISM: (*a*) Use oxygen before nitrogen at the first filling; (*b*) use a hypodermic syringe with the filling needle at the first compression; (*c*) never introduce gas unless perfectly satisfactory oscillations are registered and maintained on the manometer; (*d*) do not proceed if high pressure registration indicates persistent adhesions; (*e*) it is safer not to exceed 10 mm. positive pressure.

2. PLEURAL SHOCK: (*a*) Give morphine sulphate $\frac{1}{6}$ gr. before operation; (*b*) thoroughly anæsthetise the track of the needle before puncture is made; (*c*) introduce the gas at body temperature; (*d*) use a heated needle.

3. SEPSIS: (*a*) Scrub up thoroughly before operation; (*b*) have the skin properly prepared; (*c*) seal the opening with collodion after removing the needle.

4. EMPHYSEMA: (*a*) When using a large needle for the initial filling, slip it round the top of a rib in order that a closing valve may be more readily created by the stretched tissues; (*b*) use a platinum needle when making refills.

5. EFFUSION. May occur and cannot be avoided; it is probably due to pleural irritation or impeded lymph circulation.

Although the principles of treatment embodied in pneumothorax are so well recognized we still find many physicians who, like ourselves, were rather conservative, to say the least, in advocating the procedure. In fact, our first experience in using gas compression was with two cases of oxygen replacement. We now feel, however, that in careful hands, and under the above mentioned precautions, it is free from danger.

Klemperer states that pneumothorax must be absolutely individualized, while Jesson claims that statistics on the results of treatment with pneumothorax are of little value because the condition of the patients at the application of the pneumothorax was and always will be too diverse.

Case Reports

A CASE OF EXTRAMEDULLARY ANGIOMA OF THE SPINAL CORD

By Walter McKeown, B.A., M.B. (Tor.), M.R.C.S. (Eng.)

Associate Professor of Clinical Surgery, University of Toronto; Surgeon-in-Chief, St. Michael's Hospital, Toronto

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Assistant in Medicine, University of Toronto; Assistant Physician, St. Michael's Hospital, Toronto

THE following is a description of an unusual or possibly unique case referred to us by Dr. W. H. Harris, of Toronto, and admitted to the private wards of St. Michael's Hospital, in February, 1914: A. F., age thirty-two years, married, circulation manager for magazines and newspapers, complained of pains in the back; also weakness, wasting, pains and cramps in both lower limbs.

Present illness: Pain in the small of the back began about eighteen months before admission to the hospital, and became more severe with the progress of time. During the period between the onset of the illness and the date of admission to the hospital, it was noticed that the legs and thighs were gradually wasting, but still retained good power. In January, 1914, during the course of a few days, the lower limbs became so weak that the patient found himself quite unable to stand or walk unless assisted. Retention of urine, obstinate constipation, and cramps in the legs and thighs developed during this same short space of time. There was no history of illness in the past, and the patient emphatically denied the possibility of venereal infection.

Notes of examination, February 17th, 1914: "All the cranial nerves are performing their normal functions. The pupils are equal and regular; they react sharply to light and accommodate for distance. The sight is good and the optic discs are normal in appearance. The coördination of the arm movements is good, and there are no tremors of the limbs, lips or tongue. The grips of the hands are strong and equal. In the lower limbs there is weakness of all movements. There is also marked general wasting and slight spasticity. The left leg and thigh are more wasted and slightly weaker in their movements than the corresponding right limb. There is slight diminution of all forms of cutaneous sensibility over the outer sides of the calves and over the hamstring area of the left thigh, but this sensory change is not definite enough to enable us to map out the affected areas with any degree of accuracy. The deep sensations, including the sense of position, are apparently unaffected. The knee-jerks are very brisk and the Achilles-jerks are easily elicited. The deep reflexes of the arms are just obtainable, the jaw-jerk is absent. There is no ankle-clonus, and no response of the great toes on stroking the soles of the feet. The abdominal reflexes are absent."

The analysis of the urine showed a specific gravity of 1·020 and no abnormal constituents. A Wassermann reaction was carried out with the blood and with the cerebro-spinal fluid by Dr. R. W. Mann, and in both instances was negative. The pressure of the fluid in the spinal canal was not measured. The *x*-ray plates showed the spinal column to be normal in appearance.

Diagnosis: The paralysis of the lower limbs with the easily-elicited Achilles-jerks and the very brisk knee-jerks (even in the absence of ankle-clonus and the extensor type of plantar reflex) suggested a disturbance of the functions of the pyramidal tracts above the level of the spinal segments, concerned in the production of the Achilles-jerks (first and second sacral) and the knee-jerks (third and fourth lumbar). The bladder and rectal disturbances might also be caused by involvement of the cord at a fairly high level, in spite of the fact that reflex vesical and rectal centres exist in the conus medullaris and hypogastric plexuses. The pains in the back and lower limbs made it evident that the sensory nerve roots, supplying these parts, must have become involved; the upper limit of these pains was about the ninth dorsal segment. The objective sensory changes were very slight and indefinite, but suggested involvement of the lower lumbar and upper sacral segments or sensory nerve roots. The absence of any history of venereal disease and the negative Wassermann reaction ruled out any likelihood of syphilis of the nervous system. The long-continued pains and comparatively long history of definite muscular wasting suggested that the disease had commenced outside the cord, and that the disturbance of the cord functions had been brought about either by external pressure or an actual invasion of the cord from its periphery. The diagnosis of an extramedullary tumour of the spinal cord was made, and an operation was advised. In a letter to Dr. Harris we stated that, on account of the history of so long continued pain in the small of the back, the seat of the tumour was considered to be in the lower dorsal region. Other signs, such as the objective sensory changes, seemed to indicate extension downwards; we also called attention to the fact that cord tumours are often at a higher level than the symptoms and signs disclosed, and stated that it would not be surprising if an upward extension of the growth were found as well as a downward extension. No guess as to the nature of the tumour was attempted.

Operation, March 13th, 1914: The operation was commenced by a laminectomy of the eleventh dorsal vertebra (which is situated at about the level of the first lumbar segment of the spinal cord). The dura was very dark in colour and bulged backwards in a conspicuous manner; no pulsation could be discerned in any of the dural vessels. The laminæ of the tenth and twelfth dorsal vertebræ were next removed, and the dura was then incised. Through the arachnoid there could be seen a large mass of engorged tortuous blood vessels, which were evidently closely connected with the pia, forming an angiomatous growth. This growth was attached to the entire exposed dorsal surface of the cord and appeared closely to resemble the cavernous type of angioma, although the tubular form of the constituent vessels was not entirely lost. On retracting the lower limit of the operation wound, the normal surface of the pia could be distinguished; at the upper limit of the wound the growth continued beneath the arch of the ninth dorsal vertebra. The laminæ of the ninth and eighth dorsal vertebræ were next removed in an effort to expose the whole of the tumour. It was then seen that the growth, although much diminished in size at the level of the eighth dorsal vertebra, still continued upwards beneath the arch of the seventh dorsal vertebra. As the patient was not standing the operation well, it was decided not to extend the area of the operation to a higher level. The arachnoid was next incised, and, as a result of the relief from pressure, the growth diminished quite markedly. Catgut ligatures were placed around portions of the growth, and these when tightened caused free bleeding and a complete collapse of the vascular mass. On account of the limitation of the time in which the operation had to be completed, the profuse hæmorrhage from the growth, and the unlikelihood of being able to separate the closely adhering vessels without serious injury to the cord, removal of the growth was not attempted. It was thought that the vessels might remain in a collapsed state and the tissue undergo atrophy.

Subsequent condition: After the operation the knee-jerks and Achilles-jerks were completely lost. The pains in the back and lower limbs were less severe, but all the other symptoms and signs were much the same as before the operation. On September 7th, 1914, six weeks after the operation, our notes were as follows: "The patient looks well and has gained in weight. There is still loss of control over the bladder and rectum; the patient is being catheterized three times a day. The power in the right leg and thigh is quite good. The power in the left leg and thigh is not so good, but probably is better than before the operation. There is still some subjective pain in the back and lower limbs and also cramps in the legs at times. The objective sensory disturbances seem to be much the same as when the patient first came under our observation. The knee-jerks are present, but not brisk." On October 10th, 1914, the patient was presented before the Canadian Surgical Association which met at St. Michael's Hospital. At that time the control over the bladder was gradually returning. The urine at times could be passed without catheterization, but at other times would run away involuntarily, even when the bladder was not distended. Constipation was not so troublesome as it had been. The power and freedom of movements in the lower limbs had much improved, but the patient was still unable to walk without assistance. On October 11th, 1914, the patient left Toronto for his home in California, and since that time we have had no word concerning his condition.

On looking over the literature on spinal tumours we have been unable to find any instance of a similar variety of tumour in connexion with the vessels of the pia mater of the cord.

THE following are the officers of the Peterborough Health Association elected for the year 1915: president, Dr. Cameron; vice-presidents: Rev. Father Phelan, Mr. E. A. Peck, Mr. G. W. Powell; treasurer, Mr. W. H. Dunsford; secretary, Mrs. R. W. Travers.

Editorial

VENEREAL PROPHYLAXIS AMONG THE TROOPS

IT may not be generally known that according to the army orders, the responsibility for health and efficiency of any body of combatants rests not with the members of the Army Medical Corps, but with the officer in command. He, it is, who is held responsible for the outbreak of any epidemic, or should an undue proportion of those under him be incapacitated. It is for the members of the Army Medical Corps with him to advise and recommend measures which tend to preserve the health of the troops. On second thoughts this is seen to be essential; a man cannot serve two masters. Thus it is that, at most, members of our profession can recommend measures making for increased efficiency, but the responsibility lies with the active militant staff if the recommendations be not acted upon, and if, therefore, preventable disease is not prevented.

When, thanks to the traditional policy of English-speaking peoples, the British army in peace had been cut down to a minimum, and when now, in war time, despite the patriotism of those of military age, it is a heavy task and a terrible expense to provide a new army; when together the British and French troops do not equal in number the trained forces of Germany, it is abundantly clear that for our success and continued national existence the fitness of our troops is a matter of life and death. The British Empire cannot afford to waste and throw away the services of its soldiery from causes that are easily preventable. Let us take a glaring instance. As we write, the figures for one battalion of the Second Contingent stationed in one of our largest cities are before us. On a given day in January that battalion consisted of ten hundred and fifty-five men; of these fifty-eight (or 5·5 per cent.) were off duty on account of illness. Of the fifty-eight, thirty-eight were incapacitated through venereal disease. In other words 3·5 per cent., or much more than half of the ineffectives, were suffering from preventable disease; 2 per cent. only of the battalion were down with disease other than venereal. Nor do these figures fairly represent the prevalence of the maladies in question, as several men had recently been discharged from the battalion on account of having venereal disease. The like history comes from the First Contingent; authoritative information received from members of the staff of No. 1 Canadian General Hospital on Salisbury Plain, indicates that of the eleven hundred to twelve hundred men in hospital towards the end of January, five hundred and sixty were venereal cases.

It may be objected that the majority of these are acute cases of gonorrhœa; that modern methods of treatment effect a relatively rapid cure of both gonorrhœa and syphilis; that while it is true that there is a wretchedly high ratio of incapacity amongst the troops not actually at the front, once there preventable acute disease is greatly minimized; that, therefore, these figures do not indicate any serious reduction in the efficiency of our troops *as combatants*. There are, however, two weak points in this argument; first, the general experience that as a matter of fact troops when on active campaign are liable to be ravaged by acute venereal disease. We hear from trustworthy sources that gonorrhœa has been practically universal among the German troops operating in Poland. In the second place, the treatment of gonorrhœa is not so thorough as to eradicate the gonococcus completely, a very large proportion of men show after effects. It is safe to say that much of the rheumatism amongst men exposed in the trenches is of gonorrhœal origin, that thereby the efficiency of the men is undoubtedly lowered, and their services lost to the army at the time when they are most needed. Why all this expense in keeping and transporting men from

Canada to the front if they are to be useless at the supreme moment?

How is this miserable condition of affairs to be prevented? Undoubtedly the direct moral appeal of certain commanding officers may accomplish good. We trust that the figures above do not represent the whole of our Expeditionary Force; indeed, we are glad to know that there are battalions of the Second Contingent which to-day present a notable freedom from acute venereal disease. But to-day, as in the past, moral suasion acts over only a limited radius, nor can we depend upon all officers to exert it.

To recommend a process of compulsory immunization of the troops against these two great scourges is not feasible, because in the first place such would be regarded by an influential portion of the community as encouraging vice, and, in the second place, because such methods have not thus far been elaborated. In the French and other armies, the men are provided with prophylactic packages so that in case the temptations of the flesh are too great they may protect themselves. The experience has been that too often the men are in a state of drunkenness, or of "devil may care" exhilaration, and neglect to employ the contents of the package, so that with distribution of the packages the incidence of the disease is not materially reduced. One method only, to our knowledge, has yielded excellent results, and this is the method followed out, at first optionally, in certain companies of the United States Army at Jefferson Barracks, Missouri, in 1911, and now, if we understand aright, made compulsory throughout that army.

Briefly, the man allowed out of barracks is given a pass, and on his return if he has been exposed to infection, he proceeds to the hospital; the date of exposure is stamped on the back of the pass; a male dispensary clerk or hospital nurse is present there throughout the twenty-four hours; he does not report to the sergeant or higher officer, but to one of his own rank. Under the direction of the orderly a definite procedure is carried out, consisting of bathing the parts in a sublimate solution; an argyrol solution is retained in the urethra for five minutes, and mercury ointment applied to the glans. If a man neglects to notify and comes down with venereal disease, he is subjected to court martial.

This system was at first started as a voluntary method. The results amongst those who subjected themselves to it were so good, that in a few months it was made compulsory, and now of those who have taken this treatment, well under one per cent. have come down with either gonorrhœa or syphilis, so that the cases of acute venereal disease in several battalions have sunk almost to vanishing point. This process, it is true, cannot be expected to be effacious with leave of absence from barracks for more than a few hours. The treatment, that is, should be given within six hours after exposure to infection. Given thus, the reduction of disease is very notable, so notable that we may state unhesitatingly that it is the duty of the Canadian military authorities to follow in this matter the example of the United States army. In fact, as a nation, in the present crisis of our history, we cannot afford to do otherwise.

If this be considered too radical an innovation to introduce at once for the whole force, we suggest that the Department of Militia and Defence bring the method to the attention of commanding officers, and that they be invited to test it for a period of four months. We have little doubt but that at the end of that period the improved condition of the troops will lead to the method being made compulsory.

COMPULSORY INOCULATION

THE Allied armies have so far been spared the serious ravages of disease incidental to all great campaigns of the past; but though it is much too early to conclude that this comparative immunity will be permanent—one is reminded that the war is only to begin in May, there is still some justification for optimism. Never have the medical services of the contesting armies been so well organized, and never before has medical science been so well armed against the worst of our war pestilences.

From an interesting account of "Boulogne in War Time", for which we are indebted to Dr. Rudolf, of Toronto, and which appears on another page, it is evident that the cases of typhoid fever have begun to come in. The total among the British forces for the first five or six months of the war was four hundred and twenty-one. These figures, quoted from a letter of Sir Frederick Treves to the *Times*, dated January 26th, may not look large, but they deserve more extensive publication than they have received, at any rate in Canada, for they point the moral. Surely inoculation has already been put to a test which should satisfy all except those whose patriotism is overborne by their fanaticism, and this is no time to suffer dangerous fools gladly. Of these four hundred and twenty-one cases, three hundred and five occurred in uninoculated men, and of the thirty-five deaths, all except one were in men who had not been inoculated within two years. The one vaccinated man who died had received only one, instead of the necessary two, or preferable three, inoculations. No figures, as far as we are aware, have yet been published showing the proportion of vaccinated and unvaccinated against typhoid in the present campaign. It is safe to assume, however, if only on the grounds of one's faith in common sense, that the former greatly predominate. Surely the time has come, let us hope it is not already too late, for the authorities not only to recognize unequivocably that every uninoculated soldier is a menace to his comrades and to the success of the cause, but also to act upon that recognition.

It is not necessary to reiterate what compulsory inoculation with three successive doses of the vaccine has accomplished in practically abolishing typhoid from the United States army. Major Russell's statistics are well known. In this matter, even in what the Germans would quaintly call a "mercenary" army, the precious liberty of the individual may justly be sacrified to the manifest good of the state and, incidentally, to that individual's own good. Signs are fortunately not lacking that the saner half of the public is losing patience with the pernicious *anti*-antityphoid propaganda of the *antivivisectivaccinationist*—the solecism is less anomalous than the misguided creature it represents. About a month ago in the Imperial House of Commons, the Undersecretary made a statement to the effect that Lord Kitchener, being convinced of the reality of the danger that uninoculated men returning from leave might bring the infection to their comrades at the front, was about to issue instructions that such men be granted leave sparingly. Similar instructions have previously been issued in many regiments by individual commanding officers. To the friends of inoculation this may look like a half measure, a deplorable product of the British genius for compromise. Be that as it may, it has at least this merit, that it has aroused the frantic protests of the organized "conscientious objectors," who denounce it as insidious compulsion and thinly-veiled tyranny. In the presence of typhoid the army is face to face with an alternative evil infinitely greater than such enlightened and benevolent "tyranny." Sentiment has been growing, both here and in England, in favour of inoculation, and there can be little doubt that, in spite of the opposition of societies notoriously overendowed (with funds, not brains), public opinion as a whole would welcome the order making antityphoid vaccination in the army frankly compulsory.

THE AMBULANCE CONSTRUCTION COMMISSION

AT the instance of the founder, Mr. Henry S. Wellcome, the Wellcome Bureau of Scientific Research has provided the sum of two thousand pounds, to be distributed in the form of prizes for the best plans and designs of a body for, and improvements in, field motor ambulances. This is the first great war in which such ambulances have been used extensively. It is inevitable that many defects should be found in existing types and naturally the question has arisen as to whether something can not be done to standardize the patterns and to improve the type, both from an engineering and medical standpoint. Mr. Wellcome believes that, at a time like the present, men's minds are stimulated and alert, and that, therefore, it is more likely that valuable ideas and inventions will be forthcoming at this juncture than under normal conditions.

The control and distribution of the sum mentioned is in the hands of a responsible and representative body, termed "The Ambulance Construction Commission," appointed on behalf of the Wellcome Bureau of Scientific Research. The Commission will collect, judge, and report upon such plans, designs, and ideas as may be submitted to it. Its functions will be of an international character, so that it may obtain information from all sources. The names of the members of the Commission show that the matter is considered to be of first importance by those most intimately connected with the welfare of the wounded soldier. Sir Frederick Treves, whose long experience and distinguished service specially fit him for the task, has consented to be the chairman. The Admiralty is represented by the Director General of the Medical Department, R.N., while the Quarter-Master-General to the forces, and the Acting Director-General, Army Medical Service, represent the War Office. The British Red Cross Society is, of course, represented by Sir Frederick Treves, and the St. John Ambulance Association by Sir Claude Macdonald and Sir John Furley. The remaining members are all experts.

The prizes offered are for the best designs of an ambulance-body which shall fit a standard pattern motor-chassis for field motor ambulances. The last day for the receipt of competing designs is June 30th, 1915. It is hoped that the competition will bring in a number of ingenious designs, from which the ideal field ambulance-body will be evolved.

It may be asked why the competition is restricted to designs for a body and not for the complete ambulance, including a chassis. The reason is that a chassis takes much longer to build than a body, and that, when war breaks out, it is impossible to get at short notice anything like a sufficient number of any one type of chassis. On the other hand, a standardized body to fit any chassis of approved dimensions can be constructed in numbers at comparatively short notice. And a perfected body is badly wanted to ensure complete comfort for the wounded. Probably in addition to one design of special excellence, there will be submitted various ingenious suggestions which may be incorporated in the pattern design approved by the Commission. For these, a portion of the prize money has been set apart. The first prize is of one thousand pounds, the second of five hundred, and the third of three hundred pounds. All details of conditions may be obtained from the secretary, the Ambulance Construction Commission, 10 Henrietta Street, Cavendish Square, London, W. The competition is open to citizens of all nations.

Since the object of the Commission is to improve the existing types of ambulance bodies, and to produce, if possible, a standard pattern body of perfect design which shall fit standard chassis, all designs submitted by competitors will become the property of the Commission. Apart from the prizes there will be no payment made for designs, which the Commission may, if it approves of them, publish in some form or other. They can then be used in the cause of humanity. Arrangements will be made which will enable the government and existing ambulance associations to test and at once utilize any idea or invention upon which the Commission may report favourably, and it is Mr. Wellcome's intention eventually to publish in a suitable and illustrated form, under the auspices of the Wellcome Bureau of Scientific Research, such material and information as the Commission may deem worthy of being preserved as a permanent record.

MENINGITIS IN CAMPS

WHILE the Canadian troops were marking time at Salisbury, a feature of the casualty lists was the preponderance of meningitis cases. Now that the greater part of our forces has gone forward into France, and with some regiments in the thick of the fighting, the lists, though longer and more frequent, have taken on a less sinister character. Lives lost in battle do not give an impression of useless sacrifice like those cut off by infectious disease. It probably came as a surprise to most physicians to learn that cerebrospinal meningitis, usually considered chiefly a disease of childhood, may also harass an army. The fact is that its military history is far from being unimportant. This history has recently been outlined by Sir William Osler in a paper on "Cerebrospinal fever in camps and barracks," which he contributes to a recent number of the *British Medical Journal.* The situation at Salisbury is not specifically referred to, though the statements are made that "Slight outbreaks in two of the camps in this country have aroused interest in this disease, to which soldiers are peculiarly liable," and further that "The existing epidemics are not extensive; in one less than forty cases occurred in four months." Fortunately the disease has never been a scourge of armies in the field. The only campaigns in which it has figured were those of the early years of the American Civil War. Rather it has been a disease of barrack life. In this respect the French army has suffered most severely. During the last hundred years there have been sixty-eight epidemics in France, and no less than forty-three of these have been confined to troops. It has never prevailed to any extent in the British Army.

One of the peculiarities of epidemic cerebrospinal meningitis is its very slow spread; the case incidence, therefore, is small, and, in spite of its very high death-rate, the total mortality slight. The conditions at Salisbury were such as to favour its spread—young recruits exposed to cold and wet, and living in the close contact incident to tent life. In the absence of official reports the public has been left largely to its own imaginings. It is known that the Canadians brought the infection with them from Valcartier, and it was stated in the press that up to a month ago there had been forty cases with twenty-five deaths. Recent unofficial information has been to the effect that the outbreak was subsiding and that everything possible was being done to stamp it out. It is well known that the meningococcus may flourish in the naso-pharynx of healthy individuals, and the surest way to prevent the spread of the disease is to search systematically for these carriers, and segregate them when found. Fortunately it has been possible to carry out this laborious task at Salisbury, and it seems to have met with a success which, one may hope, will soon be complete.

It was announced in the Imperial House of Commons on February 10th that since the beginning of the war there had been four hundred and twenty-one cases of typhoid fever. Whether this total applied to the Allies in general or to the British army alone, the press despatches did not make clear. Lord Kitchener, the under secretary added, felt that there was a real danger that uninoculated men returning from leave might bring infection to their comrades at the front, and was about to issue instructions that such men be granted leave sparingly. From all accounts it is evident that sentiment is growing, both here and in England, in favour of making antityphoid vaccination compulsory.

Owing to conditions brought about by the war, the Council of the British Medical Association has decided not to hold the full annual meeting this year. The statutory general meeting will be held and also a meeting of the representative body. The annual meeting was to have been held in Cambridge.

By an Order-in-Council, published in the *London Gazette* of January 8th, Part II of the Medical Act of 1886 is made applicable to the kingdom of Belgium and, so long as this Order remains in force, any person who produces evidence satisfactory to the Registrar of the General Medical Council that he has obtained the degree of Doctor of Medicine in any of the Belgian universities of Brussels, Ghent, Liège, or Louvain, and is legally authorized to practise medicine, surgery, and midwifery in Belgium, and who satisfies the Registrar in the other particulars specified in Section 12 of Part II of the Medical Act, shall be entitled to be registered in the Foreign List of the Medical Register.

The annual meeting of the American Sanatorium Association was held at the Massachusetts State Tuberculosis Sanatorium, Middleboro, on December 16th last. The question of so-called consumption "cures" was taken up. It has been estimated that five hundred fraudulent cures were tried in the United States during the five years ending July, 1913, and that the exploiters realized an annual profit of $10,000,000. The Association declared that "all of the many advertised medicines and other forms of special treatment recommended by unscrupulous quacks are absolutely worthless." The publication in the press of advertisements of patent medicines or quack remedies purporting to be beneficial in cases of tuberculosis was strongly condemned and approval was expressed of the campaign that has been commenced against such methods of treatment.

A meeting of the Canadian Central Executive Committee for the relief of the Belgian Medical and Pharmaceutical professions was held February 19th, in the Academy of Medicine, Toronto. The Canadian committee will work in coöperation with the English committee, of which Sir Rickman Godlee, the president of the Royal College of Surgeons, is the chairman. As Sir Rickman Godlee wrote to Dr. Bruce, who is the chairman of the Canadian committee: "It would be as difficult for Canada to ensure that proper use is made of any immediate personal relief they may send to Belgium, either in kind or money, as it is for the Mother Country. We have to do what we can in that way through the instrumentality of the International Commission for Relief in Belgium, which is chiefly in the hands of the United States, who are acting with great energy and efficiency in this direction." Sir Rickman added: "It would be highly gratifying to our committee if the duty of distributing the Canadian funds were intrusted to it, but this is a matter for the Canadian committee to decide. Whatever course the Canadian committee adopts it is earnestly hoped that a considerable proportion of the collected funds will be reserved for the important purpose of reinstating the Belgian doctors and pharmacists at the termination of the war, or when Belgium can be re-occupied by its own population. When that time comes it will be well for the Canadian committee, that of the United States, and other committees to consult and coöperate with one another in order to avoid the waste that might result from overlapping, if each body were to work independently of the others." Subscriptions to the amount of $2,500 have now been received by Dr. Wishart, the treasurer of the fund, and $1,500 has been forwarded to the Central Executive Committee of Great Britain. Among the subscriptions received, in addition to those mentioned in the February issue of this JOURNAL, are the following:

Manitoba Executive Committee, $200; Manitoba Executive Committee, second remittance, $300; Dr. H. B. Anderson, $50; Dr. J. B. Gullen, $25; Druggists of Kingston, per Dr. W. T. Connell, $50; members of Kingston Medical Association, per Dr. W. T. Connell, $142; Dr. F. A. Clarkson, $10; Dr. F. R. Scott, $5; Dr. J. S. Hart, $25; Dr. R. A. Pyne, $10; Dr. S. M. Hay, $25; Dr. Geo. Gleonna, $10; Dr. H. C. Tomlin, $25; Dr. T. S. Webster, $25; Dr. J. Ferguson, $25; Dr. Thos.

Kerr, $10; Dr. R. W. Wesley, $10; Dr. T. A. J. Duff, $5; Dr. C. W. Brand, $5; Dr. J. J. Thompson, $5; Dr. W. W. Ogden, $10; Dr. E. T. Hoidge, $10; Dr. W. J. Wilson, $2; Dr. W. E. Ogden, $2; Dr. H. King Wilson, $1; Dr. A. Primrose, $25; Dr. Algernon Temple, $20; Dr. Chas. P. Lusk, $10; Dr. S. Cummings, $10; Dr. G. B. Smith, $10; Dr. F. Harrison, $5; Dr. R. A. Stevenson, $5; Dr. R. R. Hopkins, $2; Dr. W. F. Fawns, $5; Dr. N. H. Beemer, $25; Dr. H. M. Tovell, $5; Dr. A. D. McArthur, $2; Dr. W. C. Heggie, $5; Dr. J. S. McCullough, $5; Dr. Stewart Wright, $2; Dr. A. Wilson, $2; Dr. James Beatty, $5; Dr. F. C. Trebilcock, $5; Dr. J. W. Smuck, $2; T. J. Page, $10; Dr. G. and H. Carveth, $1; Dr. J. Norman, $2; Dr. E. Clouse, $1; Dr. A. A. McDonald, $25; Dr. C. E. Stacey, $1; Dr. Thos. Wylie, $5; Dr. J. F. Goodchild, $5; Dr. W. P. Caven, $25; Dr. Chas. B. Johns, $5; Dr. Gilbert Royce, $10; Dr. Angus Campbell, $5; Dr. Musgrave, $10; Dr. A. Crichton, $1; Dr. Jane Sproule, $5; Dr. D. W. MacLennan, $10; Dr. C. D. Parzitt, $10; Dr. Campbell Meyers, $10; Valley Medical Association of Nova Scotia, $50.

THE annual report of the Ontario Board of Health gives the result of investigations made into the state of the St. Lawrence river water. The water was found to contain colon bacilli in varying degree according to the season of the year and the weather conditions; for instance the contamination was much greater in August than in April. The chief sources of pollution are three in number; a certain amount brought down from the watershed, that from vessels, and that from the towns situated near the river. The water used for domestic purposes can be, and is, chlorinated, but the difficulty seems to lie in securing a *careful* and *regular* chlorination. In Brockville, for instance, the water supply has been treated for the last two years, but from December 26th to February 9th last, one hundred and fifty cases of typhoid fever were reported. The typhoid rate there during the past ten years has been 47 per 100,000 of population and in 1906 it was as high as 106. In Kingston during the same period the average rate has been 30, and in Cornwall 59; in the latter town in 1906 the rate was 85, and in 1908 it was 105. It must not be forgotten that there are places where the water is fairly free from pollution, but that certain weather conditions may arise under which the water may become greatly polluted and be the cause of a serious epidemic of disease. Artesian wells, of course, would solve the difficulty and in some places a sufficient supply of water could probably be obtained by this means. Experiments are now being conducted with this object in view.

A FEW of the medical officers captured by the Germans at the beginning of the war have at last been released, and have returned to England. After reading the accounts of the treatment they received while technically in the employ of the German government to treat wounded English prisoners, one can only share their surprise that they were released at all. The usual excuse given for detaining them in all practical respects as prisoners, contrary to the Geneva Convention, was that this was necessary in order to protect them from the fury of the populace. Of this they had ample evidence during a journey to their first place of detention, when for three days they were given nothing to eat or drink, and any requests for food or water met with insults or jeers. Protests were worse than useless. The German commanding officer, when he does not deign to give some puerile explanation for this or that offence against common decency, is often frank enough to declare that he recognizes no conventions.

THE annual report of the Manitoba provincial board of health for 1914 states that, from a public health standpoint, the conditions throughout the province may be said to be improving. The deaths from tuberculosis numbered about the same as in 1913, when three hunded and sixty-nine people died of this disease; in 1912 the deaths numbered three hundred and eighty-eight. The board of health supplies smallpox vaccine free of charge and vaccination is general throughout the province; as a result the cases of smallpox which occurred were of a mild type. The water supply of Winnipeg has never been good, but arrangements are now being made to obtain the water from Shoal Lake. About five years ago the Public Health Act was amended and it was provided that before being installed, water and sewage systems must receive the approval of the board of health. This, of course, has not affected the city of Winnipeg as its system was installed long before the Act was amended and sewage is still discharged in its untreated state into the Red and Assiniboine rivers. More accommodation for cases of tuberculosis is needed in the province. The City of Winnipeg Institution, at Fort Rouge, only receives city cases of an advanced nature. The Ninette Institution was originally intended for the treatment of incipient cases only, but it has obliged to take in advanced cases, as provision has been made only for those from Winnipeg itself. The provinical government contributed $35,000 to the Ninette Sanatorium but it was paid for largely by private and municipal subscriptions. The buildings consist of an administration building, two two-storey sleeping pavilions, a separate infirmary building, two cottages, one given by the Daughters of the Empire, the other by Rev. C. W. Gordon, a laundry and power and heating plant. No distinction is made between paying patients and charity patients, and six months is the maximum term allowed for the stay and treatment of each patient, unless unusual circumstances arise. The sanatorium was opened in June, 1910, and since then over one thousand cases have received treatment with most satisfactory result.

Book Reviews

Abdominal Operations. By **Sir Berkeley Moynihan**, M.S. (London) F.R.C.S., Leeds. Third edition, entirely reset and enlarged. Two octavo volumes totaling 980 pages, with 371 illustrations, 5 in colours. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $10 net; half morocco, $13 net. Canadian Agents, The J. F. Hartz Company, Limited, Toronto.

Even an accomplished surgeon will approach these splendid volumes with the utmost respect. They contain a record of the experience of one who is himself an accomplished surgeon and writer. Sir Berkeley Moynihan first won general recognition about eight years ago by his work on "Abdominal Operations." This was followed by "Gallstones and their Surgical Treatment," and "Duodenal Ulcer" in 1910. He had previously published tentative studies of these subjects; indeed the books named were all in their second edition. Sir Berkeley Moynihan comes of a distinguished military family, and was himself educated in the Royal Naval School. He was born in Malta in 1865 where his father, Captain Moynihan, V.C., was then stationed, but he began the search for distinction in the field of surgery and became a pioneer in abdominal operations. For several years past his writings have been unavailable, as the various editions were quickly exhausted, and the profession is under a heavy obligation to the publishers for the issue of these two noble volumes. This is the author's own book, and he describes only those operations and methods which are practised by himself. Accordingly the reader will have the direct expression of personal opinions, methods and results of a surgeon who is entitled to hold opinions, who has devised new methods, and has accomplished results of far-reaching importance. There is no detailed reference to any mechanical appliance, button or bobbin, for intestinal anastomosis, and the omission is made deliberately, for the author believes that these mechanical aids have served their purpose and that their interest is now only historical. There is a refreshing frankness about such an outspoken opinion which is characteristic of the whole book. No praise can be too high for the workmanship of the volume.

THE CANCER PROBLEM. By WILLIAM SEAMAN BAINBRIDGE, A.M., Sc.D., M.D. New York: The Macmillan Company, 1914. Toronto: The Macmillan Company of Canada, Limited.

The problem of cancer, in spite of the labour which has been lavished on it, yet remains occult and inscrutable. We do not yet know if cancer is contagious or infectious; if it can be inherited, prevented, or cured; if it is diminishing or increasing. It is to this old problem the present book addresses itself, and, if it does not leave the matter much clearer than it found it, it records all the factors and summarizes all knowledge upon the subject. The treatment of cancer is a matter for surgeons; the causes lie much deeper than surgery. Probably they are coëval with life itself, and cancer merely a manifestation of the tendency of organized tissues to return to the primordial protoplasm.

This book is one for all intelligent persons as well as for surgeons, since cancer is a subject in which all are interested. It would be hard to exaggerate the importance of it, or to describe adequately the interest with which it may be read. It is not a mine of information; all knowledge of the subject is exposed on the surface.

A TEXT-BOOK OF DISEASES OF THE NOSE AND THROAT. By D. BRADEN KYLE, A.M., M.D., Professor of Laryngology and Rhinology, Jefferson Medical College, Philadelphia. Fifth edition, thoroughly revised and enlarged. Octavo of 856 pages with 272 illustrations, 27 of them in colours. Philadelphia and London; W. B. Saunders Company, 1914. Cloth, $4.50 net. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

A book which has reached the fifth edition in so short a time carries its own commendation with it. Professor Kyle's text-book of diseases of the nose and throat has already passed under review not only on these pages but by innumerable practitioners and specialists, and all have found it good. But by reason of an extensive revision; by the incorporation of new articles or old subjects, and the consideration of new subjects like vaccine therapy, salvarsan, chronic hyperplastic ethmoiditis, and lactic bacteriotherapy, the book is practically a new one, although it retains the virtues of the old.

Local and Regional Anesthesia, Including Analgesia. By Carroll W. Allen, M.D., of Tulane University, New Orleans, with an introduction by Rudolph Matas, M.D., of Tulane University, New Orleans. Octavo of 625 pages with 255 illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $6.00 net; half morocco, $7.50 net. Canadian Agents: The J. F. Hartz Company, Limited, Toronto.

One book seems to beget another. Within the past year we have had occasion to mention at least four books on local anæsthesia, but none of them rival this one in respect of magnitude and completeness. It contains chapters on spinal, epidural, paravertebral and parasacral analgesia, and on local anæsthesia in the surgery of the eye, ear, nose and throat. Even dental practice is not forgotten. The use of local anæsthetics gained immediate currency in the Southern States, from which this book emanates, about twenty years ago as an alternative to chloroform, since chloroform, when improperly administered, is much more dangerous than ether; and chloroform was the anæsthetic then in general use in that part of the world, as it is in France till this day. No satisfactory reason has ever been advanced for this preference. Probably in the Southern States the practice of using chloroform was an inheritance from the time of the Civil War, and in France it was a protest against German methods. The introduction to the book by Professor Matas is extremely learned, and it gives an interesting account of the growth in favour of local anæsthesia. The book will, we think, be a revelation to most surgeons of the extent to which local analgesia may be employed in operations which are commonly described as major.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

THE NERVOUS SYSTEM AND ITS CONSERVATION. By PERCY G. STILES. Illustrated. Price, cloth, $1.25 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian agents: The J. F. Hartz Company, Limited, Toronto.

DISSECTION METHODS AND GUIDES. BY DAVID G. METHENY, M.D., L.R.C.P., L.R.C.S., L.F.P.S. Illustrated. Price, cloth, $1.25 net. Philadelphia and London: W. B. Saunders Company, 1914. Canadian Agents: The J. F. Hartz Company, Limited, Toronto.

A PRACTICAL TEXT-BOOK OF INFECTION, IMMUNITY AND SPECIFIC THERAPY WITH SPECIAL REFERENCE TO IMMUNOLOGIC TECHNIC. BY JOHN A. KOLMER, M.D., D.P.H., with an introduction by Allen J. Smith, M.D. Illustrated. Price, cloth, $6.00 net; half morocco, $7.50 net. Philadelphia and London: W. B. Saunders Company, 1915. Canadian Agents: The J. F. Hartz Company, Limited, Toronto.

DIAGNOSTIC AND THERAPEUTIC TECHNIC. A MANUAL OF PRACTICAL PROCEDURES EMPLOYED IN DIAGNOSIS AND TREATMENT. BY ALBERT S. MORROW, M.D. Second edition, thoroughly revised; illustrated. Price, cloth, $5.00 net; half morocco, $6.50 net. Philadelphia and London: W. B. Saunders Company. Canadian Agents: The J. F. Hartz Company, Limited, Toronto.

A LABORATORY MANUAL AND TEXT-BOOK ON EMBRYOLOGY. BY CHARLES W. PRENTISS, A.M., Ph.D., Illustrated. Price, cloth, $3.75. Philadelphia and London: W. B. Saunders Company. Canadian Agents: The J. F. Hartz Company, Limited, Toronto.

Obstetrical Nursing. A Manual for Nurses and Students and Practitioners of Medicine. By Charles Sumner Bacon, Ph.B., M.D. Illustrated. Price, cloth, $2.00 net. Philadelphia and New York; Lea & Febiger, 1915.

Students' Manual of Gynecology. By John Osborn Polak, M.Sc., M.D., F.A.C.S. Illustrated. Price, cloth, $3.00 net. Philadelphia and New York: Lea & Febiger, 1915.

Modern Medicine, Its Theory and Practice. In Original Contributions by American and Foreign Authors. Edited by Sir William Osler, Bart., M.D., F.R.S., and Thomas McCrae, M.D. In five octavo volumes. Volume IV. Diseases of the Circulatory System; Diseases of the Blood; Diseases of the Lymphatic System; Diseases of the Ductless Glands; Vasomotor and Tropic Disorders. Price, per volume, $5.00 net; half morocco, $7.00 net. Philadelphia and New York: Lea & Febiger, 1915.

Selected Addresses on Subjects Relating to Education, Biography, Travel, Etc. By James Tyson, M.D., LL.D., Professor of Medicine, Emeritus, University of Pennsylvania. Price $1.75 net. Philadelphia: P. Blakiston's Son & Company, 1914.

Infant Feeding, Its Principles and Practice. By F. L. Wachenheim, M.D. Price $2.00 net. Philadelphia and New York: Lea & Febiger, 1915.

Diseases of the Bronchi, Lungs and Pleura. By Frederick T. Lord, M.D. Illustrated. Price $5.00 net. Philadelphia and New York: Lea & Febiger, 1915.

The Vicious Circles of Neurasthenia and Their Treatment. By Jamieson B. Hurry, M.A., M.D. Illustrated. Price 3s. 6d. net. London: J. & A. Churchill, 1915.

Res Judicatæ

THE BIOLOGICAL AND OTHER BLOOD TESTS IN THE LAW COURTS

By E. K. MACLELLAN, M.D.

Halifax

IT is a striking fact in connexion with the record of what modern science has done to assist courts of justice in determining the innocence or guilt of those accused of the worst class of criminal offences, that the evidence of blood was invoked by Omnipotence itself in the first recorded murder case. In Genesis, the fourth chapter and ninth verse, it is recorded, "And the Lord said unto Cain: 'Where is Abel, thy brother?' And he said: 'I know not; Am I my brother's keeper?' And the Lord said: 'What hast thou done? The voice of thy brother's blood crieth unto Me from the ground.' " The voice of the blood of many a human brother has called from the ground in vain since then, because neither Omniscience nor enlightened human science has sat in judgment through the long intervening centuries. But at last we have attained a degree of knowledge which enables us not to hear, but to see, and to report to courts of justice the mute testimony which blood stains bear to the innocence or guilt of those accused of the fearful crime of murder.

The biological or precipitin blood test was the outcome of work done by Bordet, Tchistovitch and Uhlenhuth in 1898-99, the first experiments being conducted with eels' blood. The basis of the test is that when blood of an alien species is injected into a rabbit, the rabbit's serum has the power of producing a precipitate when mixed with serum of an animal of the same species as the one whose blood was used for the injections. In other words, the alien blood acts as a toxin, and immunity is established in the animal. The phenomenon is explained by Ehrlich's wonderful theory of immunity, which has been relatively of as great assistance to the pathologist as the atomic theory has been to the chemist.

Prior to the discovery of the "biological test" the only means of

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Read before the Laboratory Section of the Canadian Medical Association, St John, N.B., July 9th, 1914.

differentiating between the blood of animals and that of man was by measuring the corpuscles on a graduated slide under a high-power microscope. This method, while of undoubted value in examining fresh blood, is of little or no use when dried stains are submitted for examination. The corpuscles commence to shrink practically as soon as the blood is shed and in a very short time are distorted in size and shape. Certain solvents are advocated which are claimed to have the power of bringing the corpuscles back to their normal size. This, however, is largely a matter of conjecture, and of very little value where sworn testimony is required. The "biological test" on the other hand will determine, with little possibility of error, the origin of blood stains of great age, and it is accepted as admissible and proper evidence in the courts of most civilized countries.

The test requires a great deal of care and time. Roughly, the technique is as follows: Human blood serum must be obtained and kept under a rigid asepsis. This is injected into a young rabbit in doses of from 5 to 10 c.c., either intravenously or sub-peritoneally, at intervals of three or four days. After six or seven injections have been given, the rabbit can be tested to see if the desired titer has been reached, by taking a small quantity of blood from the central vein at the base of the ear and testing it with known human blood. If a reaction of satisfactory strength takes place the rabbit is etherised and bled to death. If that degree of immunity has not been reached the injections are continued. Some rabbits can never be brought to the desired titer. The blood is then centrifugalized and the serum kept until one is ready for the test.

The Test proper. The suspected stain is brought into solution with 0·85 per cent. saline and a dilution of about one in two thousand approximated. This is done by testing with nitric acid until a very faint contact ring is obtained. The solution is then passed through a Berkefeld filter and 1 c.c. of it placed in a test tube numbered 1. If there are several stains to be examined, each one is brought into solution separately and placed in test tubes numbered 1*a*, 1*b*, and so on. In test tube No. 2, one c.c. of 0·85 per cent. saline is placed; in test tube No. 3, one c.c. of blood serum known to be other than human, and in No. 4, one c.c. of known human blood serum, each of the latter diluted in the proportion of one in two thousand with 0·85 per cent. saline. To each of the four test tubes is then added 0·1 c.c. of the rabbit serum. A positive reaction ought then to occur in test tubes Nos. 1 and 4, and no change in 2 and 3. If a positive reaction takes place an opalescence developes in the solution almost immediately. It is well not to shake the solution, so that the opalescence may show up as clouds in a clear solution. The test tubes are then placed in an incubator at a temperature of 37° centigrade for about an hour. At the end of that time precipitates should be formed only in the test tubes which contain a solution of human blood. Control tests may also be made with rabbit serum which has not been humanized, which simply show that this reaction does not take place between normal rabbit serum and human blood. This control is not as a rule demanded by the courts. However, it is as well to carry it out along with the other controls.

In the courts this test, unlike many other branches of medical science which are at times the subject of expert testimony, is in very high repute, so much so that the cross examination is often superficial and in some cases allowed to go by default. This is more particularly the case when the stains have not a very important bearing or where some explanation of their origin is offered. On the other hand, some cross-examining lawyers go into the minutest details, and this seems to me much more satisfactory from the point of view of the witness—provided that the re-direct examination is as thorough. Nothing is so annoying to a witness as to be left in with statements made in cross examination where one is cut off from making explanations.

The direct examination, as a rule, merely brings out the fact that a test has been made which shows the suspected stain to be human blood. The cross examination, after the usual questions dealing with the qualifications of the witness, goes on to the history of the test. Then follows the "Ehrlich Theory of Immunity," which the witness will be asked to explain to the jury. This is in itself far from an easy task. Juries, as a rule, are not of a particularly high type of intelligence and it is very difficult to avoid the use of confusing technical terms. The theory being explained, the cross-examining lawyer usually at this point plays one of his trump cards. "The biological blood test is based on the Ehrlich theory of immunity, is it not?" "It is." "The medical profession is notorious for the frequency with which it accepts and abandons theories, is it not?" "Theories are quite often accepted for a time and later abandoned." "Provided that with the aid of some new means of observation we were able to see the changes which take place in the blood while immunity is being established and thus disprove Ehrlich's theory, would that not upset the biological blood test?" To this question the witness may safely answer

"No, it would not," for it would no more affect the value of the test than it would alter the fact that an attack of typhoid confers immunity. The lawyer, of course, hopes for an answer in the affirmative.

Following this, the witness will be grilled on the technique of the test. The lawyer, as a rule, makes it quite evident that he has spent some long evening in company with the biological blood test, and in his rôle of questioner makes it seem that the more he knows of it the less he thinks of it. He will want to know why a rabbit is chosen and not a cat or dog. He will suggest that the rabbit must be kindly disposed, meaning that it must be susceptible to immunization. He will ask about the possibility of chemicals in the stain which might precipitate the albumen of the serum, and thus make it appear as if a positive reaction had been obtained. He will want to know why a dilution in the proportion of one in two thousand is used and not a solution as strong as can be obtained. He will want to know the history of the rabbit from its birth and will suggest that it may have been previously immunized to horses' serum, in which case the stain might be horses' blood. The accused is invariably fortunate in possessing a nose which will bleed on the slightest provocation, and the witness will be asked if he can say that the stains might not have been caused in this way. In one case in which I testified the defence brought forth an expert who swore to finding nasal epithelium by microscopical examination. The blood-stained garment was not submitted to him for examination until three months after the arrest of the accused, yet he found nasal epithelium and produced photographs in court. This same witness, testifying with regard to other stains, in the same case, had also been able to find perfect corpuscles which he had measured and photographed and he found they were compatible in size only with deer's blood. This man, needless to say, was not a physician, but was a teacher of chemistry in a public school, and incidentally had been a professional expert on many subjects.

After disposing of the accused's sanguinary member his counsel will proceed. He will ask if certain bodily effusions might not give the reaction and he will endeavour to get a "yes" or "no" answer—so as to shut out qualifications and leave the impression with the jury that some normal bodily secretion might. If he is allowed by the judge to cut off qualifications, they are usually brought out in re-direct examination. He will then put the question, "Is there any blood other than human which will produce the precipitate when the rabbit is prepared with human serum?" On getting the answer "ape's blood", he will ask if this possibility has been excluded. The witness will be asked if he can determine the age of the blood and if he can tell from what part of the body it has been shed.

Summing up, he will try to establish that these various remote possibilities of error taken together constitute a decided probability, and in his address to the jury he will malign the medical profession in general, and the one who happens to be the witness in particular. The biological blood test will come in for its share of ridicule and will be characterized as wild guess-work. The highly intelligent jury, for juries are always most intelligent, will be assured of counsel's confidence that they will pay no attention to such mad theorizing.

The counsel for the prosecution in the re-direct examination clears up any points which the cross examiner has succeeded in befogging, and in his address to the jury the test will get much more gentle treatment that it did from counsel for the defence.

In the judge's charge to the jury the true attitude of the court to the test will be shown. As a rule, the charge is to the effect that the biological blood test is practically undisputed and the question for the jury is to decide from the evidence, whether or not the witness has been proved to be a competent person to apply it.

In cases where one has been unable to get a positive reaction and is called to give evidence on behalf of the defence, he will not occupy such a strong position, for a negative result does not warrant very decided testimony.

The test is a most interesting one, not only from the standpoint of its legal use, but from the fact that it has thrown decided light on the biological relationship existing between different animals. Thus we get group reactions between animals of the same species, such as the reaction between antihuman serum and apes' blood; between antibovine serum and goats' blood, and so on. These group reactions are explained by the theory of partial precipitogens. By means of these partial precipitins at some future date we may be able to carry the usefulness of the test still further and differentiate between the bloods of the various races of the human family.

Obituary

Dr. Michael Sullivan died at Kingston, January 27th, in the seventy-seventh year of his age. Dr. Sullivan, who was born in Ireland, came to Canada with his parents in 1842; he was one of the first graduates of Queen's Medical College. In 1884 he was made a member of the Senate, but was compelled to resign his seat some time ago on account of ill health.

Dr. Roy J. Wilson, of Toronto, Ontario, died January 27th. Dr. Wilson was in the twenty-fifth year of his age; he graduated M.D. from the University of Toronto last summer and in the autumn became a member of the staff of the General Hospital. Dr. Wilson joined the Officers' Training Corps and had intended to go to the front. His untimely death is much regretted by all who knew him.

Dr. George Ernest Millichamp, of Toronto, died at Guelph, January 31st, in the forty-third year of his age. Dr. Millichamp was born in Toronto, educated at Jarvis College, and graduated M.D. from the University of Toronto. He was chief medical adviser of the Union Life Assurance Company. A widow and two children survive him.

Dr. James Might, of Port Hope, died January 26th, in the eighty-sixth year of his age. Dr. Might practised in Millbrook. He retired from active practice some years ago and went to live in Port Hope. He was surgeon of the forty-sixth regiment for many years.

Dr. Amedie Des Rosiers, of Montreal, died February 7th, in the seventy-fifth year of his age. Dr. Des Rosiers was born at Berthierville, Quebec. He was educated at the St. Hyacinthe College and first went into practice at St. Pierre les Becquets. However, he soon removed to Vaudreuil where he continued to practise until a few years ago.

Dr. Reginald A. D. King, of Waterville, Quebec, died February 19th. Dr. King was a son of the late Rev. W. K. King, and was born at Quebec in 1845. He was educated at Bishop's College Grammar School, Lennoxville, and afterwards went to McGill where he obtained the degrees M.D., C.M., in 1868. Dr. King was a graduate of the Royal Military School and saw active service during the American war. He entered the volunteer militia as an ensign in 1863, and was chief medical officer for many years. Dr. King was well known in the Eastern Townships and had a large practice in Compton. He was at one time president of the St. Francis Medical Association. He is survived by his widow, three sons, and one daughter.

DR. C. J. Fagan, of Victoria, died February 10th, in the fifty-eighth year of his age. Dr. Fagan was born in County West Mead, Ireland, he studied medicine at the University of Dublin, and after graduation was honoured with the license of the Rotunda Hospital. About thirty years ago Dr. Fagan came to British Columbia and became medical superintendent of St. Mary's Hospital at New Westminster. Later he received the appointment of provincial health officer, a post which he continued to occupy until about a year ago when ill-health compelled him to relinquish his duties. In 1913, he placed his resignation in the hands of the government; it was received with great regret and as yet no permanent successor to Dr. Fagan has been appointed. Actuated by the loftiest motives and devoted to duty, Dr. Fagan will long be remembered, chiefly perhaps for his interest in anti-tuberculosis work. The attention of the public was directed to this work in 1905, when the movement first gained a firm footing in the West. Dr. Fagan, with his sincerity, eloquence and enthusiasm, pointed out the advantages of early treatment of cases of tuberculosis and, with unfailing zeal, worked for the cause he had espoused. Anti-tuberculosis organizations were formed, the general public became interested, money was subscribed, and it became possible to establish the Tranquille Sanatorium at Kamloops, which to-day is doing such splendid work.

DR. MARSHALL JACOB BROWN, of Kingston, died February 13th. Dr. Brown was born in the township of Kingston, and received his early education at Cataraqui. He attended the University of New York and, returning to Kingston, took up the study of medicine at Queen's Medical College where he graduated in 1856. He then went into practice at Cataraqui. In 1866, at the time of the Fenian Raid, Dr. Brown served as surgeon in the Frontenac cavalry. He leaves a widow and three sons.

Dr. L. J. P. Des Rosiers, of Westmount, Montreal, died February 14th, from internal injuries sustained by a fall. Dr. Des Rosiers was born in Berthier, Quebec, in 1836; he graduated from Victoria College in 1852. He practised in Westmount until a few years ago, when he retired. In 1884 and 1885, during the smallpox epidemic, Dr. Des Rosiers was medical officer of health for Côte St. Antoine, as the district was then called. He is survived by his widow and one son, Major J. L. Des Rosiers, commanding officer of the Permanent Army Corps at Quebec.

Dr. A. David, of Prince Albert, Saskatchewan, died February 11th, in the seventy-third year of his age. Dr. David was born at Picton, Ontario, in 1842. He graduated from Queen's University, and later did post graduate work at Paris, London, and Berlin. He practised for nineteen years at Calumet, Michigan, for one year in New Zealand, and for four years at Kenora, Ontario; in 1904 he went to Prince Albert. He leaves a widow and one son.

Dr. Wesley Mills, emeritis professor of physiology at McGill University, died in England from angina pectoris. Dr. Mills went to England to reside in 1910, when ill health made it necessary for him to resign from the Chair of Physiology at McGill. Born in Brockville, Ontario, on February 22nd, 1847, after receiving his early education in his native town T. Wesley Mills entered the University of Toronto. He secured his B.A. degree in 1871 and his M.A. a year later. He then entered McGill University as a student in the faculty of medicine, graduating in 1878; this was followed by a special course of study in physiology in England and on the Continent. Upon his return to Canada, Dr. Mills became first demonstrator, then lecturer in 1884, and two years later professor of physiology at McGill. A recognized leader in medical science, Dr. Mills was an authority on matters connected with animal intelligence and to this he joined an intense love for music and a deep and unfailing interest in the spread and direction of education. He was a member of the Royal Society of Canada, and on two occasions was elected president of the section to which he belonged. Professor Mills was the founder of the Society for the Study of Comparative Physiology, which was organized in Montreal in 1885, the president of the Montreal Natural History Society, president of the Montreal Medical Veterinary Association, and among other important positions, the vice-president of the Society of American Naturalists, and the Montreal Medico-Chirurgical Society. Dr. Mills' publications in book form were five in number, namely: "Animal physiology," "Voice production," "Comparative physiology," "The dog in health and in disease," and "The nature and development of animal intelligence."

News

ONTARIO

At a meeting of the Galt Hospital Board, held on January 20th, it was resolved that the city council should be requested to submit a by-law for $15,000 to the ratepayers, to enable the board to pay off a deficit of that amount.

Diphtheria has been very prevalent in Ottawa but there have not been many new cases during the last few weeks.

A slight epidemic of smallpox broke out in Brantford at the beginning of last month. Vaccination was not made compulsory but, after some delay, it was strongly advised by the city council and public vaccinators were appointed. The sum of twenty-five cents was charged and the city undertook to pay the fee if the person vaccinated was unable to do so.

The construction of the first unit of the new hospital at Hamilton will be begun as soon as possible. A beautiful site on the mountain was chosen some time ago and the plans have been prepared for a four-storey building which will cost $150,000. This building will accommodate about sixty semi-private patients; the top floor will be used as nurses' quarters and the main floor for administration purposes.

The Bracebridge Isolation Hospital was burned down on the morning of January 30th.

The Queen Mary Isolation Hospital, at Peterborough, was open for 286 days last year. Fifty-six patients were treated; forty-seven were cases of diphtheria, of whom five died, and nine were cases of scarlet fever.

SMALLPOX was reported in one-third of the counties in the province during January, namely, from the counties of Brant, Elgin, Essex, Haldimand, Hastings, Lambton, Middlesex, Muskoka, Nipissing, Norfolk, Oxford, Parry Sound, Perth, Thunder Bay, Waterloo, Wellington, Wentworth, and York. One hundred and seventy cases of the disease were reported.

DR. G. R. PIRIE, of Toronto, and Dr. H. D. Spence, of Kingston, have been admitted members of the Royal College of Surgeons.

THE Brockville General Hospital recently entered an action against the township of Elizabethtown for the amount of $65.20, the maintenance cost of an indigent patient from that township. The hospital has had great difficulty in obtaining from municipalities the monies due for the care and treatment of indigent patients coming from such municipalities, and action was taken as a test case. The case was tried before the honourable Mr. Justice Reynolds, who gave judgment in favour of the hospital.

A FURTHER epidemic of measles is reported from Hamilton. During the week ending February 13th, one hundred and thirteen cases were reported. Most of the cases occurred in the west end of the city.

DR. W. S. DOWNHAM has been appointed temporary assistant medical officer of health of London, to assist Dr. Hutchinson until a permanent successor to the latter is appointed.

THE new general offices of the National Sanatorium Association, College Street, Toronto, were formally opened by His Excellency the Lieutenant-Governor of the province on February 10th. Mr. W. J. Gage, of Toronto, contributed $100,000 towards the building. Mr. Gage has also given $10,000 for scholarships to be awarded for research in tuberculosis.

DR. HUGH A. STEVENSON has been elected mayor of London.

QUEBEC

AT the annual meeting of the Sherbrooke Hospital, the president stated that one-half of the patients treated in the hospital came from the neighbouring townships and that, in his opinion, more financial assistance should be rendered by these municipalities. The patients in the public ward paid $1 a day, but the expense incurred by the hospital amounted to $1.70 exclusive of medicine and dressings.

The financial year of the Protestant Hospital for the Insane, Verdun, for the year 1914, closes with a deficit of $12,490.99. The expense of maintaining the hospital has increased through the advanced cost of food and through the higher wages paid for assistance. The medical superintendent, Dr. T. J. W. Burgess, attributes the condition of a large percentage of the 665 inmates of the asylum to mental anxiety, domestic affliction and disappointed affections. Sixty-one men and sixty-four women were discharged during the year, the percentage of recoveries being 35·17, almost four per cent. higher than in 1913, when it was 31·62. There were eleven escapes during the year and six of them were recaptured. Of those admitted one hundred were Canadian born, sixty-five were born in Great Britain or her colonies, and forty-four were foreigners, twenty-one of whom were Russians. Mr. I. H. Stearns was elected president of the hospital board.

It is expected that the Quebec civic hospital will be completed by the middle of next April. The hospital is situated near Mastai; it will have a frontage of 166 feet and a depth of 56 feet, and will contain four wards with eleven beds in each. The institution will be conducted by the Sisters of Charity.

MANITOBA

It is announced that a military hospital is to be established at Winnipeg.

Dr. F. S. Keele has been appointed medical officer of health of Portage la Prairie, in succession to Dr. A. E. Walkey.

ALBERTA

The following is the list of infectious diseases reported in Lethbridge during the year 1914: typhoid, 89 cases, 4 deaths; scarlet fever, 39 cases; diphtheria, 8 cases, 3 deaths; chicken-pox, 43 cases; measles, 5 cases; German measles, 2 cases; tuberculosis, 13 cases, 3 deaths; smallpox, 5 cases. The births increased from 231 in 1913 to 395 last year; the deaths were 155 in 1914, and 189 in 1913.

A SYSTEM of medical inspection of school children is to be inaugurated in Calgary. A room will be equipped as a dental clinic at a cost of $2,000, and a second room will be properly equipped for the examination of the eye, ear, nose, and throat; the equipment of the latter will cost $1,000. Doctor Evelyn Windsor has been appointed chief medical inspector at a salary of $2,000. A consulting physician will be appointed who will receive $500 a year, and five nurses will be engaged at a monthly salary of $75 each.

THE question of overcrowding came up for consideration at a recent meeting of the Calgary board of health. Present conditions are making it unusually difficult for the poorer classes to secure a shelter for themselves and families and, in many cases, landlords are renting single rooms provided with gas stoves and water to families. This, of course, is a violation of the health laws of the province. In consideration of the conditions existing at present, it was decided that the law should be enforced only to the extent of requiring two rooms, a bedroom and a kitchen, for the use of families. In the case of girls employed during the day, who prepared their breakfast or supper in the room in which they slept, no objection would be made.

SASKATCHEWAN

THE plans have been completed for a hospital at Melville. Construction will be commenced early in May. The buildings will consist of four storeys and will provide accommodation for one hundred and fifty beds.

A CONFERENCE took place recently at Melfort between the members of the Lady Minto Hospital board and delegates from the various rural municipalities in the district. On this occasion the delegates expressed themselves strongly in favour of making a direct annual grant to the hospital instead of basing their contribution upon the number of indigent patients received from the municipality. The secretary of the hospital board stated that during the past year the hospital had received eight times as many patients from the rural districts as from the town of Melfort itself.

Dr. A. E. Kelley has been appointed medical officer of health for Swift Current.

BRITISH COLUMBIA

The death rate in Victoria during the past year was an exceedingly low one—6·67 per thousand; the infant mortality was only ·6 per thousand. The city was also singularly free from infectious disease, although 468 vessels from plague ports docked there during the year. In Vancouver the death rate was 8·9 per thousand of population. The rate of mortality among children under three years of age amounted to 1·9 per thousand. The contagious diseases reported were: smallpox, 8 cases; chicken pox, 441 cases; measles, 103 cases; scarlet fever, 60 cases; mumps, 155 cases; diphtheria, 16 cases, one death; whooping cough, 118 cases, 5 deaths; typhoid fever, 50 cases, 5 deaths; tuberculosis, 222 cases, 126 deaths; epidemic cerebrospinal meningitis, 3 cases, 2 deaths. The population of Vancouver is about 114,200. During the year no less than 10,999 rats were killed on the 3,366 vessels from foreign ports.

During the year 1914 the cost of maintenance in the Vancouver General Hospital amounted to $1.98 a day for each patient. This is less than in 1913, when it was $2.11. A maternity wing is to be added to the hospital and the plans are in course of preparation.

An amount of $24,000 is outstanding against patients who have received treatment at the Royal Columbia Hospital, New Westminster. The hospital is badly in need of money and unless some arrangement is made to guarantee the necessary funds, it will be unable to continue its work. It appears impossible to collect the various sums which make up the $24,000 from patients and, until it is proved that such patients are indigent, the municipality to which they belong is not responsible for payment.

MEDICAL COLLEGES

Manitoba University

At a meeting of the University Council, which took place February 11th, it was decided that a medical student in his fifth year who interrupted his work to go to the front, should, on his return, be granted his degree provided he agreed to take at least six months' training in a hospital in the province of Manitoba.

A BRANCH of the Canadian Officers' Training Corps is to be established at the University. Students of the University and of the affiliated colleages may join the corps.

Queen's University

ABOUT thirty members of the final year in medicine were granted degrees, and left on Friday, February 19th, to join the staff of the Duchess of Connaught's Hospital.

Laval University

THE Militia Department has sanctioned the formation of a French-Canadian clearing hospital for overseas service. The hospital will be organized under the auspices of Laval University by Colonel Labelle and Lieutenant-Colonel A. Mignault. The personnel will consist of one lieutenant-colonel, two majors, two junior officers, one quartermaster, nine sergeants, seven corporals, and fifty rank and file.

Toronto University

IT is announced that an offer made by the faculty of medicine of the University of Toronto to supply a base hospital for overseas service has been accepted.

LIEUTENANT-COLONEL FOTHERINGHAM, associate professor of clinical medicine, is the chief medical officer of the second contingent of the Canadian Expeditionary Forces. Other members of the staff of the medical faculty who have been giving their time in preparing for the mobilization of the second contingent are, Captain J. A. Amyot, professor of hygiene; Lieutenant-Colonel J. A. Roberts, demonstrator in clinical surgery; Lieutenant G. B. Strathy, demonstrator in clinical medicine; Lieutenant Bruce Robertson, assistant in pathology.

AT the opening of the session the Caput, Senate and the Faculty Councils passed regulations to provide that standing should be granted to those who, by reason of enlisting, had been unable to take their September supplementals, and that at the end of the session those who had enlisted, or who would do so, should be shown the utmost consideration compatible with the university's duty to the public in maintaining professional standards. It was further decided to discontinue all teaching and laboratory work after four o'clock in the afternoon in order to enable students to take the courses of drill and instruction required by the regulations of the Officers' Training Corps. The women students of the university are occupying the hours from four to six in the afternoon with sewing and other work for the Red Cross Society.

Besides the members of the staff who left with the first contingent, there are with the troops one hundred and thirty-four graduates and eighty-three privates from the university.

LIEUTENANT-COLONEL ARTHUR WALLACE SCOTT, formerly demonstrator in anatomy at the University of Toronto, will be in command of the clearing hospital now being organized by Lieutenant-Colonel G. S. Rennie, of Hamilton. The hospital will accompany the second contingent, and Lieutenant-Colonel Scott will take command on its arrival in England. The officers are: Lieutenant-Colonel A. B. Osborne, Captain G. S. Strathy, Captain H. L. Jackes, Captain Bruce Robertson, of Toronto; Captain J. F. Sparks, of Kingston; Drs. Foster and James E. Davey, of Hamilton. Captain G. B. Strathy, of Toronto, will be quartermaster. About fifty of the fourth and fifth year medical students will accompany the hospital; they will go as supernumeraries with the understanding that later they will receive commissions. As they will probably leave before the completion of the academic term, they will be given credit for their examinations and the fifth year men will be granted their medical degree.

McGill University

The officers of No. 3 McGill General Hospital are: Lieutenant-Colonel Herbert Stanley Birkett, officer commanding; Lieutenant-Colonel H. B. Yates, Drs. John M. Elder, John McCrae, J. George Adami, W. H. P. Hill, Edward W. Archibald, A Howard Pirie, L. J. Rhea, William G. Turner, Campbell P. Howard, Herbert M. Little, W. B. Howell, Colin K. Russel, W. Hutchinson, J. C. Meakins, Wm. W. Francis, J. A. MacMillan, R. H. M. Malone, L. H. McKim, W. T. Ewing, J. C. Wickham, H. C. Dickson, H. C. Burgess, L. L. Reford, R. St. J. McDonald, Donald Hingston, J. G. Browne, David Law, quartermaster, and A. Stevenson, dentist. Supernumerary, Revere Osler. There are still a few additional appointments under consideration.

Mr. Revere Osler is the son of Sir William Osler; he will probably serve as assistant quartermaster and will join the hospital in England. With three exceptions the physicians are all members of the medical faculty of the university. Dr. Howard is professor of medicine in Iowa State University. Among the fourth and fifth year students who will accompany the hospital as dressers are the following:

Fifth year students: G. R. Baby, Hamilton; P. Belanger, Ottawa; G. C. Burrows, Guelph; H. F. Ebberts, Victoria, B.C.; C. D. Kean, Brookfield, Newfoundland; G. L. Kennedy, Ottawa; George F. Laing, Windsor; L. H. Leeson, Vancouver; B. Frank MacNaughton, Hopewell Cape, New Brunswick; A. J. Martin, Ottawa; H. K. Neilson, Arnprior; I. D. Ramsay, Waskada, Manitoba; Lee Smith, Vancouver; William Templeman, St. John's, Newfoundland; F. S. Walcott, Barbadoes; C. O. Walsh Canso; H. C. Wert, Avonmore; A. B. Wilkes, Brantford; R. D. Wilson, Hull, Iowa; J. P. Denny, Georgetown, British Guiana; A. D. Sharp and W. F. Dawson.

Fourth year students, M. C. Abell, Bayhan, Ontario; C. K. Church, Aylmer; G. I. Hall, Westmount; N. M. Guiou, Ottawa; C. J. Kendall, Ottawa; W. C. Lowry, Lennoxville; G. A. Lyons, Moncton; E. A. McCusker, Regina; H. J. Mack, Cornwall; and W. H. Miller, Victoria, B.C.

The thirty-third annual banquet of the McGill Medical Society was held at the Place Viger Hotel, Montreal, February 18th. The guest of honour was Dr. L. F. Barker, professor of medicine at Johns Hopkins University. Dr. Barker is a graduate of Toronto University. Among those present were Dr. Peterson, principal of the university, Dr. Birkett, and Dr. R. P. Campbell, who has returned from Salisbury Plain to take command of No. 6 Field Ambulance in the second contingent.

Dalhousie University

On February 10th, Professor D. Fraser Harris delivered a lecture on "The influence of Greece on science and medicine" which was one of a series of lectures on Greece being given this session at the University. Speaking of the Oath of Hippocrates, Dr. Fraser Harris said it was a noble document and, at the present day, an admirable guide in matters of medical ethics. It was also pointed out that in some respects the treatment in classical times was much more enlightened than that in the Middle Ages.

ARMY MEDICAL SERVICES

Colonel H. R. Casgrain, of Windsor, Ontario, is in command of the Canadian Hospital No. 2, which has been established in France, thirty miles from the battle front. The hospital is equipped with twenty beds.

Lieutenants G. O. Taylor, of Moncton, New Brusnwick; R. F. Flegg, of Otawa, and S. R. Harrison, of Minnedosa, Manitoba, have left to join the staff of the Duchess of Connaught's Hospital at Cleveden. Lieutenant-Colonel W. F. Gorrell, of Ottawa, is in command of the hospital.

Dr. Henry L. Jackes, of Toronto, has joined the staff of the clearing hospital which is to be in command of Dr. Wallace Arthur Scott.

Dr. Maxwell Inglis, who has been in charge of the *x*-ray department of the Winnipeg General Hospital for some years, has left for England on his way to the front where he will have charge of the *x*-ray work in one of the Canadian hospitals.

Several cases of diphtheria occurred among the members of the 25th Nova Scotia Regiment while quartered at Halifax and some cases of meningitis have developed among the troops at the Exhibition camp, Toronto.

The following Canadian medical officers are on the staffs of the British hospitals at Boulogne: Captain F. H. Mackay, Montreal; Colonel R. D. Rudolf, Colonel Wallace Scott, Major Percy Goldsmith, Captains P. K. Menzies, G. R. Philip and C. E. Cooper Cole, J. C. Calhoun and W. L. C. MacBeth, of Toronto; Major R. L. Gardiner and Captain N. MacLeod, of Ottawa; Captains W. Bethune, Norman C. Leslie and W. H. Tytler, of Hamilton; Captain J. Comer Wilson, of London.

At the end of January there were on the waiting list of the Department of the Militia, one thousand three hundred doctors and two thousand eight hundred nurses.

Colonel Fiset, the Deputy Minister of Militia, has been promoted to the post of Surgeon General of the Canadian Army Medical Corps. Colonel Fiset served with the first Canadian contingent during the South African war.

Dr. MacDermott has been appointed regimental surgeon of the 46th Battalion, which has its headquarters in Regina.

Dr. H. Thwaites, of St. Helena's Medical Mission at Jerusalem, has joined the Army Medical Corps.

Dr. G. K. Hobson, of Cypress River, Manitoba, has joined the Princess Patricias.

Dr. Orr, medical officer of health of Medicine Hat, has been appointed medical officer of the Third Mounted Rifles. During his absence Dr. McLeod will act as medical officer of health.

Dr. H. J. Hassard, of Portage la Prairie, Manitoba, has been selected for service with the overseas Army Medical Corps. Dr. Hassard was lieutenant in the 18th Mounted Rifles.

Lieutenant-Colonel E. C. Ashton, of Brantford, Ontario, will command the 36th Regiment which will form part of the third contingent of the Canadian Expeditionary Forces.

Dr. J. A. Crozier, of Port Arthur, has left for the front.

Major E. A. Lebel, of Quebec, who accompanied the first contingent as a member of the staff of No. 1 General Hospital, has been given command of the Fighldran Military Hospital.

The following doctors are among those who have volunteered for active service: Major W. B. Hendry, G. A. Winters, Captain H. D. Jackes, Captain H. Buck, Major C. H. Gilmour, C. A. A. Warren, Major C. J. Currie, Captain H. R. Holmes, Major G. D. Farmer, Captain D. C. Kappele, H. M. Captain W. Ames, Captain N. J. L. Yellowlees, Major J. E. Davey, Captain G. E. Greenway, Captain W. L. Silcox, Captain W. F. Nicholson and J. H. G. Eccles, G. S. Strathy, K. G. McKenzie, J. F. Burgess, N. J. Barton, L. B. Robertson, H. M. Nicholson, G. W. Anderson, J. N. Humphrey,

F. M. Walker, F. S. Park, J. B. McMurrich, R. H. Thomas, L. C. Palmer, J. D. Fitzgerald, H. L. Reazin, O. J. Day, E. A. P. Hardy, A. C. Bowswell, R. J. Henry, H. G. Willson, F. E. Watts, V. H. McWilliams, H. C. Sharpe, H. E. Ferguson, A. A. Fletcher, M. G. Thomson, G. F. Boyer, R. W. McIntyre, E. Boyd, W. E. Struthers, A. H. Caulfield, J. W. S. McCullough, W. S. Whittemore, G. D. Porter, F. A. Dallyn, H. C. Parsons, W. W. Cruise, H. C. Pearson, W. H. Eby, J. E. Knox, J. C. Masson, V. W. McCormack, R. V. Leonard, R. E. Harkins, D. T. Evans, J. H. Cascaden, J. P. Mitchell, F. J. Colling, T. D. Cumberland, H. H. Eyres, R. Home, S. J. N. Magwood, W. W. Hume, W. Butt, E. P. Lewis, C. S. Wynne, C. C. Ballantyne, E. C. Syer, G. Strathy, S. McD. Coulter, J. G. Gallie, H. R. Conn, H. K. Detweiler, F. R. Hanley, F. Ed. Hughes, W. A. Scott, H. E. Ferguson, F. H. Pratten, A. M. Cleghorn, A. C. Martin, F. J. Livingstone, A. Pain, R. H. Paterson, J. Roberts, A. D. Unsworth, G. C. Clegg, W. T. Little, I. D. Hayes, T. J. McNally, I. N. Uril, J. V. Brown, R. A. Jamieson, R. St. E. Murray, A. F. Bastedo, F. J. Matthews, F. C. MacDonald, T. L. Buttress, R. W. Young, D. G. S. McKay, T. A. Gourley, A. P. Hart, H. R. McIntyre, K. E. Cooke, G. Wilson.

VALLEY MEDICAL SOCIETY

The eighth mid-winter session of the Valley Medical Society, which is representative of the counties of Kings, Annapolis and Digby, was held at Bridgetown, Nova Scotia, January 27th, Dr. M. E. Armstrong presiding. The meeting was well attended and the programme proved of much interest. Among the papers read were: "The treatment of lacerated wounds," by Dr. N. E. Mackay, Halifax; "Senile gangrene," by Dr. L. R. Morse, Lawrencetown; "Accidents and acute conditions of the eye from the standpoint of the general practitioner," by Dr. A. C. Fales, Middleton; "Case report for diagnosis," by Dr. Archibald, Bear River. In the evening a public meeting was held by the society in the interest of the anti-tuberculosis campaign in Nova Scotia and the following addresses were given: "The tuberculosis situation in Nova Scotia," by Dr. W. H. Hattie, provincial health officer, Halifax; "The need and value of the tuberculosis hospital," by Dr. A. F. Miller, of the provincial sanatorium, Kentville; "The treatment of tuberculosis of to-day," by Dr. George DeWitt, Wolfville. After the meeting, a reception was held by Dr. and Mrs. Armstrong. The society voted the sum of fifty dollars for the relief of distressed physicians in Belgium.

BOULOGNE IN WAR TIME

IN ordinary times Boulogne is a busy seaport, chiefly for passenger traffic between here and England. During the summer it is also a favourite watering place, and the hundreds of bathing machines now safely drawn up on the beaches away from the fury of the winter storms bear evidence of this. The numerous hotels and cafés also, usually with signs printed both in French and English—and indeed often in German—show what a gay place it is in summer and how cosmopolitan must be its passing population. When the "season" is over, most of these places are, as a matter of course, closed, and the regular inhabitants settle down to a time of little excitement, the traffic will only consist of the regular packet boats for England, carrying the mails and a few passengers, who hurry shivering from the boats to the trains for Paris, and of the trawlers, which must needs ply their dangerous trade, regardless of the weather. The risk that they run is great, and two of these boats have already gone on the rocks and have soon been broken up there in the last few weeks.

But this year all this is changed, and Boulogne, instead of settling down to its wonted winter's calm, is a busy place, with much traffic in the harbour, and many people in the streets. All this, not because of any boom in trade, but because it has been chosen as the hospital base for the British forces in France, and, when one studies this traffic, it is seen to be all concerned with the care of the sick. Thus, most of the men in the streets are in *khaki* and the women in various nursing uniforms, and they speak English—with various accents it must be admitted, for they hail from every part of the Empire. The wheeled vehicles are nearly all motor ambulances, or at least Red Cross motor cars on various errands of mercy, while in the harbour are to be seen a number of hospital ships, plying with their sad cargoes between here and Southampton.

In times of peace Boulogne has only a couple of hospitals, for it is only a small town, but now there are very many of these, as nearly all of the summer hotels and several other large buildings have been thus transformed. For example, a large sign over the Imperial Hotel tells the stranger that it is now "No. XI General

Hospital," over the *quondam* Casino there is placed "No. XIII General Hospital," and so on. And over all fly the Union Jack and under it the Red Cross flag of the R.A.M.C. or of the British Red Cross Society. This society is very active here and has a number of the smaller hospitals under its own auspices and also supplies most of the ambulances and other motor cars used in connexion with the care of the sick. On the whole, these improvised buildings make very good hospitals, but they are cold, and the original sanitary arrangements were, as a rule, insufficient. The equipment of these hospitals leaves little to be desired. Each is provided with a good laboratory and *x*-ray apparatus and everything necessary for the scientific care of the patients. The nurses are all fully qualified, which is an important matter. At the fever hospital at Wimereux (No. XIV Stationary) some good work is being done on the different strains of the paratyphoid bacillus and other problems connected with continued fevers, while, at No. XIII General, Sir Almroth Wright has a good laboratory where he wrestles with various questions of immunity.

The medical staffs of the hospitals are drawn from the R.A.M.C. permanent force; next from temporary officers of this force, who have enlisted for the duration of the war, and lastly, from the Red Cross Society. Besides these there are a number of consultants who are generally men of recognized reputation, who go round to the various hospitals and see such cases as require a further opinion.

The sick and wounded are brought down from the firing line and the various clearing and other movable hospitals near there in ambulance trains. When they arrive here they are usually in a state of mud that speaks eloquently of the condition in which they have been living in the trenches. When they first arrive they are tired out and generally sleep for most of the first few days, unless their condition keeps them awake. A few, however, are a stage farther than this in exhaustion and cannot sleep at all for a time. They are undressed, thoroughly washed and put into clean beds between sheets; and it must seem to many of them as if heaven could really exist on earth, as they lie there clean, warm, well fed, with nothing to do and no sound of firing in their ears.

Early in the war the cases coming down were nearly all surgical, but now they are about evenly divided. As regards the surgical ones, there are a great many shrapnel wounds, and these are all septic. There are many cases of bullet wounds, mostly, they say, inflicted by snipers. There is a regular corps of snipers in the

German army, with a special badge. No cases of bayonet wounds reach us. This is probably because they are usually quickly fatal. Most of the gunshot wounds of the body that reach here are thoracic. The abdominal ones are not fit to travel and will be treated nearer the front. These thoracic ones are of great variety and present some most anomalous physical signs, they are often complicated with pneumothorax and hæmothorax, and many are septic. On the other hand, it is marvellous how a bullet may pass through the chest in a line which would seem necessarily to involve vital structures and yet do no harm. Thus recently a man was seen who had been "sniped" several days before. The bullet had entered the second right intercostal space in the "aortic area" and had come out just below the angle of the left scapula, and yet he was quite comfortable and had walked three miles after he had been shot.

Very many men come in from so-called "frost bite," and these are often bad cases and not infrequently become gangrenous. The trouble is always in the feet and, strictly speaking, is not due to frost, of which there has been very little, but rather to cold and wet plus obstruction to the circulation from tight clothing. As a result of this an order has been given calling attention to this and urging that the putties be put on very loosely.

As regards the more purely medical cases, the most common disease that we see is "myalgia," the so-called muscular rheumatism, in which the patients have indefinite but often very crippling pains and tenderness in the various groups of muscles. Occasionally, however, one sees examples of rheumatic fever, and these seem always to have previously suffered from the disease. There are many cases of bronchitis, very often with a history of previous attacks, and a few are severe and complicated with bronchopneumonia. Lobar pneumonia of course occurs, but probably not oftener than in civil life, and, so far, does not threaten to be epidemic. On the whole, it is wonderful how few instances are seen of acute conditions commonly attributed to "taking cold," and the opponents of the "chill" theory of the causation of disease have much to support their view in this campaign. Even the horses, it is said, keep wonderfully well at the front, but when brought back to the "rest camps," where they are under cover, they soon develop various diseases. The same thing was seen at Salisbury Plain, where the poor animals would *healthily* shiver through the long cold nights and yet, when put in improvised stables, would suffer from bronchial catarrh in large numbers.

A fair number of cases of typhoid fever are now coming in and, already, the beneficial effects of inoculation are very evident. According to the latest figures to hand, as quoted from a letter of Sir Frederick Treves to the *Times* of January 26th, "*of the first four hundred and twenty-one cases of typhoid fever in the present campaign among the British troops, three hundred and five were in men who were not inoculated. In the four hundred and twenty-one cases there have been thirty-five deaths. Of these deaths thirty-four were men who had not been inoculated within two years. Only one death occurred among patients who were inoculated, and that man had only been inoculated once.*" Sir Frederick well adds: "*In view of the grievous injury inflicted upon our gallant troops by those who—in widely disseminated leaflets—advise the soldier against inoculation, one wonders if the Defence of the Realm Act is not sufficiently powerful to put a stop to this heartless crusade and this playing into the hands of the enemy.*" The suspects are first admitted to the various hospitals and when diagnosed are all sent to the special hospital at Wimereux (a village about two miles from Boulogne) for treatment and isolation. They are not labelled as typhoid until the Eberth bacillus has been obtained from the stools or the blood. The Widal reaction, of course, is tried for as a routine, but is of no value in recently inoculated cases as it is then positive in any case. And, by the way, it is just in these protected cases that most of our difficulties in diagnosis arise, as they are usually very atypical. A good many suspected cases turn out to be paratyphoid of both *alpha* and *beta* varieties. So far there has been no mortality among these and they are nearly always very mild. One shivers to think what the epidemic would already have been like among the British if they had not been to a large extent protected by inoculation. Certainly every physician, who has seen anything of the conditions of this campaign would hail with pleasure a ruling that no man should be allowed to take part in it who had not been efficiently inoculated.

As the Canadian papers have stated, there are some cases of cerebrospinal meningitis amongst the Canadian troops, but one must speak with caution on this subject at present. It may, however, be said that Sir William Osler, in a recent letter after he had just returned from Salisbury Plain, writes: "I do not think that the epidemic is likely to be severe." We can only hope that this forecast may be a true one, both on account of the fatality of this disease as also that a severe outbreak might delay the Canadian troops in coming to the front.

Strange as it may seem, there are a certain number of cases of venereal trouble coming down from the front. They are isolated in a special building. All the other infections are present in small numbers.

A good many men are admitted with various circulatory complaints, all of which come under the delightfully indefinite title of "D.A.H." which, being intrepeted, means "disturbed action of the heart." This class always needs a good deal of sifting, including as it does, every form of cardiac irregularity and also all cases of cardiac failure. In most instances the condition is only one of sinus irregularity, due usually, or at least associated with, flatulent dyspepsia. A certain number of instances of cardiac failure, however, also occur, and, no doubt, when the troops come to more open fighting, with forced marches, etc., these will be much more common.

As regards Canadian matters in France, so far, the only Canadian hospital that has been established is No. II Stationary. They are out at Le Touquet, about eighteen miles from here and are very comfortably housed in the well-known Golf Hotel there. They are very well equipped and are doing good work. There are fourteen medical officers of No. II General Hospital in and near Boulogne. They have been temporarily lent to the British hospitals here until such time as their own unit is established. The news has just come that this is to take place immediately, but in the meantime they have been seeing a lot of how such hospitals are run, so the time has been well spent.

Boulogne, it will be seen, is a very busy place just now, but in war time changes occur quickly, and at any time an order may go forth changing the British hospital base to somewhere else. In that case Boulogne will be deserted and will at once settle down again into its pristine winter calm, only disturbed by much house-cleaning against the very slim chance of a "season" next summer.

R. D. Rudolf.

No. XI General Hospital, Boulogne, 29th January, 1915.

LAMBTON COUNTY MEDICAL ASSOCIATION

The regular meeting of the Lambton County Medical Association was held in Sarnia on February 10th. The following officers were elected for the coming year: President, Dr. R. M. Calder, Petrolea; Vice-president, Dr. J. James, Sarnia; Secretary-Treasurer, Dr. J. E. Kidd, Wyoming. Dr. H. A. Bruce, Toronto, read a paper on "Septic peritonitis, complications and treatment."

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Journal of Medicine and Surgery, February, 1915:

Diagnosis, symptomatology and pathology of poliomyelitis anterior acuta .	R. G. Armour.
The medical treatment of anterior poliomyelitis	G. W. Howland.

The Western Medical News, February, 1915:

Medical inspection of schools in Edmonton	T. H. Whitelaw.
Milk and its uses	J. W. Turnbull.
Some observations on thymus gland .	W. R. Coles.

The Public Health Journal, February, 1915:

The home hospital	W. P. Capes.
The instruction and choice of suitable nurses for district work in the home, tuberculosis and infant welfare departments	M. A. Mackenzie.

The Canadian Practitioner and Review, February, 1915:

The diagnosis of subtentorial tumours .	G. W. Howland.
The treatment of urethral stricture . .	R. Pearse.

Dominion Medical Monthly, February, 1915:

The diagnosis and treatment of precancerous lesions of the lower lip .	G. Chambers.

L'Union Médicale du Canada, February, 1915:

La science expérimentale en médecine .	E. G. Asselin.

Medical Societies

CANADIAN MEDICAL ASSOCIATION

Annual Meeting

As previously announced, the Forty-eighth Annual Meeting of the Canadian Medical Association will be held in Vancouver, B.C., July 6th, 7th, 8th, and 9th. With Dr. R. E. McKechnie as president-elect, the several committees are hard at work in the effort to make the meeting in Vancouver an unqualified success. Replies are coming in from all parts in Canada and the United States; and from present indications, in spite of the unsettled condition of world politics, the meeting in July bids fair to be well up to standard.

Medical men from the east are looking forward to the trip through the Canadian Rockies, which in grandeur of scenery is surpassed nowhere in the world: "A thousand Alps rolled into one." Special round-trip rates, to be announced later, are being made to the Panama Exposition at San Francisco. Each medical man should take a vacation once a year. He owes it not only to himself, but to his patients. A programme is being prepared whereby our guests may enjoy their holiday to the full, and we all may come in touch with the highest and best ideas of our contemporaries. "As steel sharpeneth steel so doth the countenance of a man his friend."

Endeavours are being successfully made to have the symposia the principal items of the programme. "Chronic arthritis" and "Chronic renal infections" have been selected and many prominent men have signified their intention of taking part in the discussions, among whom are Dr. Hugh H. Young, of Baltimore, Dr. A. McPhedran and Professor A. B. Macallum, of Toronto. More detailed announcements will be made next month.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The third regular meeting of the society was held Friday evening, November 6th, 1914, Dr. F. A. L. Lockhart, vice-president, in the chair.

Living Cases: 1. Two cases showing the end results in the treatment of congenital hip dislocation, by Dr. J. Appleton Nutter.

The first case (N. K.) was only fourteen months of age and had not begun to walk when her condition was diagnosed by Dr. Dunstan Gray. The *x*-ray shown demonstrated that the left hip was out of place. Reduction by manipulation was at once attempted under ether. It was not found especially difficult to put the hip back in place but stability of the reduced joint seemed very poor; the Lorenz or frog position was found to hold the hip more securely than any other. Many spicas had to be applied owing to their destruction by urine. Four months after the operation the hip was found to have become re-dislocated anteriorly, but it was without difficulty put back in place and treatment begun again from the beginning. With successive spicas the leg was brought down towards the perpendicular. As I was afraid of the head escaping anteriorly, strong internal rotation was employed. For months the child, who had learned to walk while under treatment, stumped around in a spica reaching to her toes, her foot being turned directly inwards. A year after the second reduction all plaster was removed and a flannel bandage substituted. The patient still walked with her left foot and leg twisted towards the right side but no special effort was made to overcome this. After a couple of months of flannel bandage this was removed. As you can see the child now walks perfectly, the left foot is held normally and there is no shortening.

The second patient (J. K.) was diagnosed by Dr. Charles Gurd marked right limp and much lordosis. An *x*-ray (which was passed when she was two years of age. She was able to walk with a around) showed the right hip out and in addition an exaggerated antiversion of the femoral neck and under-development of the right side of the pelvis. The hip was reduced by manipulation in July, 1913. Stability seemed rather poor. The frog position of Lorenz seemed to hold the hip more securely than any other. In this case the child was older and not so much difficulty was experienced in keeping the spica dry. In all, four plaster of Paris dressings were applied, the leg being gradually brought down to the side and at the same time twisted inwards to prevent the head of the femur from escaping anteriorly. The child walked around in her plaster one year from operation when the plaster was removed; the foot was gradually allowed to straighten itself. She now presents a perfect result, no trace of limp or shortening being evident.

2. Impaction of denture in œsophagus, by Dr. G. E. Armstrong.

The young man, who lived in the country, swallowed a plate with two teeth on it. A week later he came to Montreal with the plate firmly impacted in the upper end of the œsophagus just below the cricoid. The temperature was 104°, there was aspiration pneumonia and he was very ill. Dr. Jamieson tried to remove the plate by the mouth. It could be seen and one could get a good grip upon it but any force which Dr. Jamieson felt justified in using would not bring it out. The man was too ill for an anæsthetic. About a week afterwards he had a pretty severe hæmorrhage, in fact quite severe, losing six or eight ounces at one time. The temperature was falling, the pneumonia undergoing resolution and it now seemed urgent that the plate should be removed before he had another hæmorrhage. I did an œsophagotomy under local anæsthesia, which was quite satisfactory. I got down to the œsophagus just above the clavicle on the left side, drew the sterno-mastoid, the great vessels and the pneumogastric nerve outwards, pulled the omo-hyoid upwards and outwards with the retractor. The recurrent laryngeal nerve lay in front and I went in behind it so that there nothing was injured. There was very little bleeding. When I got hold of the plate it was quite evident that no sufficient force could have been applied through the mouth. It was very firmly imbedded and required a good deal of manipulation to loosen it. The patient has had no hæmorrhage of any account since, and the inside wound is healed and the outside practically all healed.

Pathological Specimens: Series by Dr. L. J. Rhea.

1. Enchondroma of the finger. From the outdoor service of Dr. Tees. Patient aged sixty, for eighteen years had on one of his fingers a slowly-growing tumour which was easily enucleable and proved to be an enchondroma. It is very typical and shows the adaptability of such a tumour to its position; down the centre is a groove where it rested on the bone of the finger.

2. Brain with cerebro-spinal meningitis. Boy, aged twelve, well up to about seven hours before entering hospital, when he was taken acutely ill, and came in with definite symptoms referable to the central nervous system. Diagnosis of meningitis. Spinal canal tapped and a large quantity of fluid recovered in which pneumococci were present. Ears were examined for otitis media, with negative results. Child died on third day. Spinal canal was tapped several times and each tapping brought away fluid thicker and more turbid than the last. At autopsy diffuse cerebro-spinal meningitis was seen, most marked on the lateral aspect of the right cerebral hemisphere. In searching for the primary focus of in-

fection I found it in the ethnoid cells of the right side which were filled with pus and from here the pneumococci were recovered in pure culture.

3. Heart with acute endocarditis. Male, aged twenty-two, no history of rheumatism or tonsilitis; four months before entering hospital began to have symptoms referable to the heart. Since then his symptoms have increased and he came to the hospital with a clinical picture of hypertrophied heart, mitral stenosis and regurgitation. The chief interest in the specimen is the size of the exudate upon the aortic valve. This has undergone calcification. In the centre of the exudate which has become calcified there is a small canal through which blood must have passed. In the mitral valve one sees a very definite aneurysm and here one notes the relation of the caecified exudate to this lesion in the mitral valve; it is seen that this large exudate on the aortic valve comes in direct contact with the under-surface of one leaflet of the mitral. At this point there is an area of ulceration and at the base of this ulcerated area the weakened valve has dilated, forming an aneurysm.

4. Large polyp. Dr. Lockhart removed the polyp this afternoon from a woman, aged fifty years, who complained of difficulty in micturition for the past year and during the last week had to be catheterized. The polyp has undergone extensive necrosis and is evidently infected. The woman has all the signs of a general infection. I show it on account of its large size and the extensive necrosis present.

Paper: Typhoid perforation, by Dr. G. E. Armstrong.

Discussion: Dr. F. T. Tees: During the time I was medical superintendent of the Montreal General Hospital I had, through the courtesy of Drs. Shepherd, Hutchinson, and Armstrong, the opportunity of operating on seven cases of typhoid perforation, of which four recovered, or 57 per cent. Some of these cases are of special interest: One young man had a very definite history of perforation fifty hours before operation, and he was one of the fortunate. Another patient came in from the Typhoid Emergency Hospital for operation but during the ride in the ambulance his courage failed and he insisted upon being taken home. Some hours later a telephone message came to the hospital that he wished to return and would undergo operation. With more humanity than judgment on our part he was admitted and the perforation closed. He died soon after. Another fatal result was in a little girl from the Hervey Institute who was operated on without delay and was apparently doing well, when another perforation occurred. Dr. Armstrong was in the ward at the time and the patient was again operated upon but died a few days later. We found at autopsy some eleven terminal perforations.

The high percentage of recoveries in this series is due not so much to the technique of the operation, which is simple, but to the early diagnosis, and this was made possible by the keenness of the house surgeons. The fact that of four cases which perforated within the hospital, three (or 75 per cent.) recovered, speaks volumes for the watchfulness of the internes and largely accounts for the measure of success which I am able to report.

Dr. A. E. Garrow: I do not know anything in the way of acute abdominal surgery in which it is more difficult to decide to operate than in abdominal symptoms during typhoid fever. I saw a case some two or three weeks ago of Dr. D. P. Anderson's with all the symptoms of typhoid perforation, patient toxic, acute onset of abdominal pain, localization of pain to the lower abdominal zone followed by distension and more or less rigidity, with sudden drop of temperature and apparent disappearance of liver dulness. These all occurred before I saw the case. We decided to wait for a day or two and the symptoms subsided. The patient was kept under observation and improvement generally took place and he was placed under medical care in the Royal Victoria Hospital. Subsequently severe hæmorrhages occured with terminal symptoms, the patient dying with acute abdominal pain and either actual or threatened perforation had taken place. I do not think many surgeons make the mistake of letting a perforation go, but I think that every surgeon who has had much experience with this has opened the abdomen and found no perforation. I have opened twice to find nothing but a large quantity of yellow turbid fluid, usually great enlargement of the glands in the lower portion of the mesentery and numerous flake-like patches over numerous ulcers in the lower part of the bowel. This was done under local anæsthesia and did not seem to militate against a comparatively rapid recovery, in fact there was marked improvement of the condition. As Dr. Armstrong has said it is extremely difficult to give a symptom-complex in any particular case which is pathognomonic of perforation.

Dr. D. P. Anderson: The case of mine to which Dr. Garrow referred was particularly interesting. It demonstrated the frequency with which you get cases without any suggestion of perforation. This case I remember to have visited about half past twelve, and as I do in all typhoid cases, examined very carefully along the course of the ileum for evidence of tenderness; there was not the slightest evidence of anything having gone wrong and at half past two the patient had all the symptoms that Dr. Garrow has depicted.

Dr. L. J. Rhea: One point which Dr. Armstrong referred to is of interest, the acute peritonitis in typhoid without perforation. I once showed before this Society the mesenteric nodes from two cases of typhoid in both of which there was acute suppuration. In a third case, operated on for acute peritonitis, it was found that one of the mesenteric nodes had ruptured and the adjacent nodes were quite markedly necrotic. Cultures from the fluid in the abdominal cavity showed typhoid bacillus in pure culture.

Dr. A. G. Morphy: I had a case of a man in the Lachine General Hospital who in the third week of typhoid fever developed a sudden pain in the abdomen. I saw him a short time afterwards and found the abdomen rigid. We found a perforation of Meckel's diverticulum, which was sewed up, and the man made a good recovery.

Dr. C. F. Martin: Having had the good fortune of seeing patients with perforation and having been able to observe what the surgeons have done, I was much interested in Dr. Armstrong's paper. I wonder if perhaps his opinion concerning the sudden onset of pain as associated with tenderness corresponding with the site of the pain, bears very much weight in the diagnosis. We have laid a good deal of stress in the course of typhoid upon the coincidence of location of sudden onset of localised pain and the corresponding tenderness, as of a good deal of importance; on that symptom-complex alone we would ask the surgeon to operate. A year or two ago I came across a similar case to which Dr. Rhea refers and a year or two later we had cases simultaneously in the two hospitals of the same nature—localised pain in the right iliac fossa, with tenderness. The cases were operated upon in each institution and large and hæmorrhagic glands were found around the ileum, but no perforation. Both cases were closed up and did well. Leucocytosis was present, in one 14,000 and in the other 17,000, so we thought we were all the more justified in having the abdomen opened. Dr. Armstrong said little or nothing about the leucocytic count in suspected perforation cases; he probably has little faith in the efficacy of that means of telling a perforation. Some years ago I got Dr. Russel to observe this count in a great number of cases and he found the variation so great that it was not worthy of consideration as a decisive criterion, and although we still take the blood count we do not lay too much stress on it for diagnosis.

What Dr. Armstrong said about the rectal examination appealed to me very much, as so often we have confirmed our diagnosis by this means. If there is abdominal pain low down and tenderness in the rectum we would feel strongly like recommending that the abdomen be opened, so useful is this as a sign in typhoid perforation.

Dr. D. F. Gurd: I have seen another means of diagnosis which has helped in obscure cases and that is the use of the stethoscope and getting a localized râle from the abdomen.

Dr. J. Alex. Hutchison: I have nothing particular to offer in the way of discussion but would say that all house surgeons should be on guard for perforation in typhoid fever. Within this week one of our men diagnosed a perforation in less than an hour but unfortunately the man died within an hour from a second perforation.

Dr. G. E. Armstrong: Two or three points have been brought out in the discussion; first, the association of pain and tenderness. I think it can be stated that as a general rule the tenderness is over the lesion. The maximum point of tenderness is over the lesion in all perforative conditions whether the gall-bladder, stomach, intestines, appendix, etc., and when there is pain and no tenderness then certainly a rectal examination should be made. It is well to make it in all cases and sometimes you will get definite tenderness where you fail to find it from ordinary pressure over the abdominal wall. There are a few cases which do not follow that rule, but they are rare. In 50 per cent. the tendernoss is noted as general. In appendix cases pain may be referred as over the umbilical region in the neighbourhood of the solar plexus and only a little later the patient will refer his pain definitely to the right lower quadrant and occasionally I have seen the pain complained of definitely on the left side while the ruptured appendix was on the right. In the same way you may have pain complained of in the one side where there is a stone of the kindey on the opposite side. The leucocytosis I have practically given up as a diagnostic sign in typhoid perforation. A few years ago we worked at it assiduously and we found it unreliable; it was present to a marked degree without perforation and certainly in a good number of our perforations leucocytosis was not perceptible so I do not pay much attention to this. As to second perforations; these sometimes can be closed. I had one patient who recovered after the close of a second perforation, another case did very well till the twenty-third day when he had a third perforation which was in the old wound; we could see it in the intestine as it dropped right out and a perforation took place within the abdomen and carried him off. Two or three days ago I had a case in hospital with very definite symptoms of perforation; I saw him within a very short time, the symptoms were quite clear and he was brought to the operating room at once. As soon as the abdomen was opened, out came a tremendous amount of gas and the abdomen flattened right down. I pulled out the lower end of the ileum but could find nothing there; I examined the cæcum, went back to the intestine and followed it right through to the transverse mesocolon; there were some evidences of trouble around the jejunum but I could find no perforation. I examined the cæcum, ascending colon, transverse, sigmoid, rectum—no perforation. I closed the abdomen and returned the patient to the ward. At autopsy Dr. Oertel found the perforation in the splenic flexure just under the diaphragm. Another remarkable thing about this was that there was no soiling of the peritoneal cavity. This is one of the rare situations for a perforation; as a rule yoú can count on it being within the terminal fourteen inches of the ileum.

CASE REPORT: Calculus nephritis with bilateral occlusion of ureters, by Drs. A. E. Garrow and H. Oertel.

Patient a young woman of twenty-nine; good health until March 10th, 1913, when she sustained a fracture of the thigh which was treated in the West and for which she remained a long time in bed. She was perfectly healthy except for this fracture until Christmas when she experienced slight, dull, aching pains in the right side for ten or twelve days. This recurred in March for two of three days, and again in August; it was felt in the right costal margin and was of a dull aching character without radiation; in September she passed several small stones. At this time while in hospital she had suppression of urine which lasted three days. So far as we could learn at no time did she have bladder disturbance or pain in the left loin. She returned to hospital on October 10th with a history of sudden pain in right side radiating to groin. She had never passed any blood, but since this last attack there had been more or less daily vomiting. She was unable to retain food and we began rectal feeding. The quantity of urine passed varied from twenty-six ounces on the second day after coming in, through five, seven, eight, nine, ten, fourteen and nine ounces. There was a distinct trace of albumin, a few red blood cells and, in addition to granular casts, a relative and total diminution in the quantity of urea passed each eay. She was bright, skin was clear, no œdema of limbs or eyelids. Temperature subnormal throughout; there was no diarrhœa, no bladder disturbance whatever. She had a foul, fœtid breath, bright red tongue and wanted constantly to drink, and no sooner would she have it than it was rejected again. An attempt was made to tide her over this calculus uræmia, to take advantage of the compensatory function of the skin, hot packs and hot baths, salt solution intravenously, but there was no perspiration. After each of the attacks we had a slight improvement in the quantity of urine passed and some improvement in the vomiting. The patient was bright for the first six or seven days but for the last three was rather dull; her condition seemed to be improving on the day she died and for fourteen hours there had been no vomiting. In the morning of the day she died she became very drowsy, breathing laboured, pulse weak throughout became imperceptible, and she died apparently from cardiac failure. The object of our treatment had been to tide her over what was apparently a condition of calculus uræmia sufficiently to open one or other kidney. She had never at any time complained of symptoms in the left side, all were in the right, and I would have taken it for granted that this was the functioning kidney; it was my intention under local anæsthesia to have done either a single or a double nephrectomy and, if further improvement had taken place, to remove the stones present. She was not catheterized nor was the bladder examined, nothing was done to militate against the very serious condition from which she suffered on entering the hospital.

Dr. H. Oertel: Very little has to be added to this case except to demonstrate the specimen. The whole urinary system is the seat of very extensive stone formation, which involves not only the kidney but the pelvis and the markedly dilated calices, but extends down through the ureter into the bladder which also contains several large stones. It is interesting to note that occlusion has occurred at the origin of both ureters immediately below their insertion into the pelvis of the kidney. The character of the stones is that of earthy phosphates. Undoubtedly the condition has existed for some time inasmuch as one can observe that the mucous membrane is markedly thick throughout and that the pelvis is markedly dilated and a hydro-nephrosis exists. The calices extend far up into the medulla of the kidney. In addition to a subacute inflammatory lesion there has occurred a more recent acute sero-purulent exacerbation and this involves in an ascending fashion the kidney substance so as to produce a rather typical diffuse ascending pyelonephritis. This is particularly marked in the medulla and involves in patches the cortex. While the cortex has remained comparatively free from the purulent exudate it shows very marked general œdematous swelling with degeneration of the epithelial cells and gradual involvement of the kidney parenchyma of the cortex in the inflammatory exudate. Any operative interference in this state was of course out of the question and it is doubtful whether recovery could ever have taken place sufficiently to admit of any operative interference in the future for the extensive stone formation involved the whole urinary system.

TORONTO ACADEMY OF MEDICINE

NOVEMBER MEETING OF SPECIAL SECTION

CASES IN PRACTICE AND SPECIMENS PRESENTED.

By Dr. Geoffrey Boyd: 1. Multiple exostoses removed from the middle ear by simple mastoid operation.

2. Pipe stem removed from the pharynx of an elderly man. Had been in this position for a month. Associated with some loss of motion and pain in the arm of the same side, suggesting pressure on the origin of the brachial plexus.

Dr. H. J. Hamilton discussed this case.

By Dr. Colin Campbell: Cyst in the anterior chamber, shewing two lobules. There is a history of a wound some years ago, but this began to cause trouble only this summer; it has enlarged considerably in the last month, and Dr. Campbell considered it probably due to inclusion of some epithelial cells at the time of the perforating corneal wound. To be reported later.

By Dr. Edmund Boyd : Polyp in a child of six years with a long pedicle appearing to come from the antrum. A chief interest in the case is the youth of the patient. At present Dr. Boyd is undecided as to the method to be pursued for its removal, but leans to simple snaring and a close watch for return. Should the latter happen he would consider it proof of its antral origin, and would probably open the antrum.

By Dr. Trebilcock: Some cases of wounded eyeball: 1. Punctured wound in the inner ciliary region caused by portion of a large split pin. Loss of vitreous, but after a smart reaction a good recovery. At present a mass protruding into the vitreous at site of wound, and a lens becoming cataractous.

2. Punctured wound of the cornea. Inverted U-shaped, with the angles going just to the limbus. Caused by large shears.

Wound closed well, but after two months began to leak slightly at both angles. Eye quite quiet at present.

3. Punctured wound of cornea, done with large screw-driver. Traverses the upper outer third of the cornea to the limbus at both angles. Wound closed for nine weeks but eye still irritable and likely to give trouble.

4. Punctured wound of the sclera; piece of nickel ore 10 mm. × 5 mm. × 3 mm. removed from the vitreous after being there ten days. Removed with forceps through a new wound made at the site of *x*-ray localization. Result very good. Vision shadows.

5. Punctured wound of sclera. Small particle of steel removed from vitreous with giant magnet through a new opening. *X*-ray used to localize. Result good.

6. Punctured wound of sclera. Metal seen shimmering in vitreous with ophthalmoscope, and localized. Removed with small magnet through new opening made directly over present position. Steel in eye thirty hours. Result good.

Dr. Durnham read a report of his successful use of Bardsley's punch in a case of acute glaucoma. The classical signs were all present, but the conjuctiva was brawny and stiff and the anterior chamber very shallow. He considered it an unfavourable case for an ordinary iridectomy on account of the difficulty, and the brawny conjuctiva made the management of the flap very difficult in Elliott's method. He had succeeded admirably with Bardsley's scleral punch which entered the chamber easily, and cut and removed the disc at the limbus quickly and easily. He had also done an iridectomy, but the iris had remained so nicely in its place and plane that another time, under such circumstances, he thought he would omit the iridectomy. He expressed himself as extremely gratified with the outcome of the use of this little scleral punch.

Dr. O'Connor detailed the course of three cases of mastoid abscess treated by operation and blood clot. Two had done well, and the third had broken down. He considered this a satisfactory method in selected cases, especially where there is a mono-bacilliary infection. He said they did not as a rule do well where the infection was multi-bacilliary. Drs. Biggs and Edmund Boyd discussed this question.

Dr. Wishart, temporary chairman; Drs. Davies, Reeve, G. Boyd, Maclennan, C. Campbell, Bell, Trebilcock, and others, took part in the discussions.

Discussion of the question of eyeball wounds was left over on account of the full programme and the late hour.

Dr. Gilbert Royce was proposed as chairman of the section in the absence at the seat of war of Dr. Goldsmith. This recommendation was sent on to the council.

MEETING OF DECEMBER 14TH, 1914

CASES PRESENTED. Dr. O'Connor: A man, aged thirty-six, who had suffered from cough for several years before coming to Canada seven years ago. Had night sweats at times and a husky voice. Since coming here the general condition has been fair so that he has been able to attend to his work of driving a team with intermission. For a year and a half he has had some pain in the throat on movement, as in swallowing, slight but always referred to the left side at the level of the upper border of the thyroid cartilage. Also a sensation of lump in the throat and a desire to swallow it. Slight loss of strength, a cough, and a husky voice. Personal and family history lend no aid. The examination of the throat revealed a thickened, cloven, epiglottis folded on itself, from side to side, and front to back, so that it hid the picture of the larynx. However, the arytenoids were seen to be swollen and œdematous, as were the ventricular bands. The chest was found to show evidence of involvement of both apices, and tubercle bacilli found in the sputum. A section of the thickened epiglottis shows giant cells.

Dr. Royce spoke of the pain on movement of the larynx; of the loss of strength as being slight for such extensive lesions, and of the normal temperature.

Dr. E. Boyd remarked on the marked symmetry of the lesion, and asked if the laxity of such an epiglottis would be a factor in a tuberculous infection thereof.

Dr. McLennan said it was strange that there had been so little loss of vitality in so extensive disease.

Dr. Wishart detailed Richard Lake's idea that the infection of laryngeal parts was almost always secondary to chest disease and due to the definite lodgement there of bacilli from the sputum. He wondered if the folded shape of this epiglottis was primary and a causative factor, or secondary to involvement.

Dr. Royce described the turban shape of the epiglottis as he had first seen it but could not answer Dr. Wishart's question. He thought that part to the right of the cleft had shown some abrasion, and spoke of his method of painting such suspected abrasions with weak silver to show them up brilliantly against the surrounding pink or red background; however, the whole epiglottis in this case was too white to use this method. He considered there was also slight involvement of some intralaryngeal tissues.

Dr. Wishart showed a rhinolith removed from the nose. The patient was a woman of seventy-two years, who had suffered from a severe neuralgia of the left side of the nose and the gum. Examination of the nose showed a mass lying on the floor against the septum, about an inch and a quarter back. A part of the mass had been removed four months previously. The present mass was too large to remove anteriorly but was successfully brought through the posterior nares. The rhinolith was about one inch by three-quarters by five-eighths, and lay in a hollow in the floor of the nose. At first he thought it might be a sequestrum, but the smooth bed precluded that. Careful examination revealed no sure origin for the mass. The neuralgia had not been relieved.

Dr. Angus Campbell described a somewhat similar case. A rhinolith was removed from the nose of a young woman over twenty, and in the centre was found a piece of slate pencil which she said she had pushed there when a child.

Dr. Wishart then presented the following case of suppurative middle ear with mastoid involvement, simple operation with blood clot. T. E., aged twenty three, male, suffered from deafness of the right ear, and discharge for twelve months, beginning without pain, and also from discharge of the left ear for a number of years, with strong odour. Of late, there has been pain in the right mastoid, so severe as to necessitate remaining away from work. On examination, hearing, right ear, 20/60, small perforation in the anterior inferior quadrant, slight moisture, mastoid tender, but no swelling; left ear, hearing contact, membrane absent, except in the attic, remains of ossicles, stinking discharge, and granular internal wall.

When seen first, six months ago, regular treatment of the ears with intra-tympanic syringing and alcohol drops ordered. There was no improvement in any of the symptoms, and operation was decided upon. Right ear mastoid opened and curetted, but dura mater not exposed. The aditus was thoroughly cleared and the middle ear syringed. The aditus was then plugged with iodoform powder, the cavity filled with blood clot, and the incision entirely closed by sutures. In the left ear remains of the ossicles were removed, the middle ear curetted, and the eustachian tube curetted with Yankauer's instruments.

The wound of the right ear was healed within a week, the canal was mopped out twice daily, and drops of alcohol, acid boracic and bichloride instilled. The left ear was syringed twice daily for a few days, after which it was mopped only and dry boric acid blown in.

The case is shown to demonstrate the conservative method of treating the right ear, where the hearing was fair, and where any interference with the middle ear was very inadvisable. The patient has been in hospital only two weeks, and is now ready for discharge.

Dr. Crosby showed a case with a small mass in the upper part of the vitreous having an indefinitely serrated border. There had been some iritis, and pain; slight injection. No sign of the mass appeared from outside. It had not the definite shape one would expect in a malignant involvement of the ciliary body, yet he thought it had its origin there.

Dr. Reeve said it looked like an indefinite opacity in the equator of the lens, but he would like to see it in a month.

Dr. Maclennan thought it arose from the ciliary region and might be dangerous.

Dr. Trebilcock said it was very shallow, inasmuch as one could almost get behind it with the ophthalmoscope used very obliquely. It must be a slight exudation associated with the iritis which had been present, but was not now. The inflammatory process may have been more a cyclitis, or more at the irit root. He did not think it looked like a sarcoma, but would ask to have the case shown again.

Dr. Trebilcock showed: 1. A case of keratitis in a boy of fourteen. Said to have come on after attendance at a wheat threshing two months ago. There were infiltrations in all the layers of the cornea, with a broad leash of vessels coming over from the upper, outer quadrant. The grey patches were discreet, and the rest of the corneal rim was clear cut. The case did not appear to be specific in the local signs, nor had the boy the ear-marks of congenital syphilis.

2. A boy of four years who had his eye cut with a piece of glass early in February last. Sitting behind a window the latter had been broken with a thrown snow-ball. The upper lid had been cut and the sclerotic pierced in the upper, inner quadrant far back. Vitreous was protruding but no blood in the chamber. The edges of the wound were carefully probed, but no glass felt. The pro-

truding vitreous was removed and the wound sewn. The immediate recovery was good. For three months the boy saw as well as before with the injured eye, then the outer quadrant of the iris seemed to recede, making an irregular pupil; and early in the summer there developed a hyphæma. The latter persisted all fall, and was associated with slight circum-corneal injection, and photophobia. In the last month, under dionin, the anterior chamber has cleared and the injection become markedly less. The pupil is irregular in shape, but no synechiæ. No fundus reflex to be seen. The tension slightly minus, but the eye not tender. Is the eye a safe one to leave?

Dr. Reeve spoke of work done by Browning, making a differential leucocyte count, an increase of monos meaning the coming of sympathetic; but the test had been misleading in one of his cases. He thought it safe to temporize in this case.

Dr. Maclennan thought the eye must come in the class of dangerous ones and sooner or later would come to enucleation; the sooner the better. There might be a spicule of glass in the eye, but if so it was the safest kind of a foreign body to have there.

ONTARIO MEDICAL ASSOCIATION

The following is the provisional programme for the annual meeting of the Ontario Medical Association:

Tuesday, May 25th: Registration.
Wednesday, May 26th: Morning—Registration.
Afternoon—Business, General Session.
Evening—General Session, President's Address, Address in Medicine.
Thursday, May 27th: Morning—Sectional Meetings.
Afternoon—General Session, Business Meeting, Address in Surgery.
Evening—General Session, Symposium on Heart.
Friday, May 28th: Morning—Sectional Meetings.
Afternoon—General Session, Business Meeting.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. Murray MacLaren, St. John, N.B. President-elect—Dr. R. E. McKechnie, Vancouver. Secretary-treasurer—Dr. W. W. Francis, 836 University Street, Montreal.

Annual Meeting, Vancouver, B.C., July 6th to 9th, 1915.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. H. B. Anderson. Secretary—Dr. J. H. Elliot.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. R. G. Brett, Banff. Secretary—Dr. F. C. Clarke, Calgary.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. G. Johnston. Secretary—Dr. J. L. Allen.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. G Adami, Montreal. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. N. E Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. C. A. Hodgetts. General Secretary—Major Lorne Drum.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr H. V. Kent, Truro.

EDMONTON MEDICAL SOCIETY:—President—Dr. J. S. Wright. Secretary-treasurer—Dr. Jamieson.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. Frederick McEwen, Aylmer, Ont. Secretary-Treasurer—Dr. A. B. Riddell, Bayham.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell

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HAMILTON MEDICAL ASSOCIATION—President—Dr. John Y. Parry. Corresponding Secretary—Dr. P. D. MacFarlane. Recording Secretary—Dr. O. W. Niemier.

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LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. R. M. Calder, Petrolea. Secretary-Treasurer—Dr. J. E. Kidd, Wyoming.

LONDON MEDICAL ASSOCIATION:—President—Dr. C. H. Reason, 538 Dundas Street. Secretary-treasurer—Dr. L. S. Holmes, 260 Hamilton Road.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith, Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

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NIAGARA DISTRICT MEDICAL ASSOCIATION:—President—Dr. E. T. Kellam, Niagara Falls. Secretary—Dr. G. M. Davis, Welland.

NOVA SCOTIA MEDICAL SOCIETY—President—Dr. G. E. DeWitt. Secretary—Dr. J. R. Corston.

ONTARIO MEDICAL ASSOCIATION:—President—Dr. D. Gibb Wishart, Toronto. Secretary—Dr. F. A. Clarkson, 421 Bloor Street West, Toronto. Local Secretary—Dr. J. B. Mann, Peterborough.

Annual Meeting, Peterborough, May, 1915.

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PETERBORO MEDICAL ASSOCIATION:—President—Dr. E. A. Hammond. Secretary—Dr. J. B. Mann.

PICTOU COUNTY MEDICAL ASSOCIATION:—President—Dr. C. S. Elliot, Stellarton. Secretary—Dr. John Bell, New Glasgow.

PRINCE EDWARD ISLAND MEDICAL ASSOCIATION:—President—Dr. A. A. MacDonald. Secretary—Dr. W. J. MacMillan, Charlottetown.

REGINA MEDICAL SOCIETY:—President,—Dr. Gorrell. Secretary—Dr. Dakin.

ST. JOHN MEDICAL SOCIETY:—President—Dr. D. Malcolm. Secretary—Dr. F. P. Dunlop.

ST. THOMAS MEDICAL ASSOCIATION:—President—Dr. D. L. Ewin. Secretary-treasurer—Dr. James A. Campbell.

SASKATCHEWAN MEDICAL ASSOCIATION:—President—Dr. G. P. Bawden. Secretary—Dr. C. G. Sutherland, Moose Jaw.

Annual meeting, Moose Jaw, July 27th, 1915

SASKATOON MEDICAL ASSOCIATION:—President—Dr. T. W. Walker. Secretary—Dr. J. T. Mackay.

SWIFT CURRENT DISTRICT MEDICAL ASSOCIATION:—President—Dr. Graham. Secretary-treasurer—Dr. Hughes.

THUNDER BAY MEDICAL SOCIETY:—President—Dr. R. J. Manion. Vice-President—Dr. Eakins. Secretary-treasurer—Dr. J. G. Hunt.

VALLEY MEDICAL SOCIETY:—President—Dr. M. E. Armstrong, Bridgetown. Secretary—Dr. T. M. MacKinnon, Berwick, N.S.

VANCOUVER MEDICAL ASSOCIATION:—President—Dr. W. D Keith. Secretary—Dr. J. H. MacDermot.

WEST ELGIN MEDICAL SOCIETY:—President—Dr. Crane, Wallacetown. Vice-president—Dr. Webster, West Lorne. Secretary-treasurer—Dr. Smith, Fingal.

WINNIPEG MEDICAL SOCIETY:—President—Dr. James McKenty. Secretary—Dr. D. F. McIntyre.

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ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PHTHISIS

By C. D. Parfitt, M.D., C.M., and D. W. Crombie, M.D., C.M.

Gravenhurst, Ontario

Part I.

REST of the affected part has long been regarded as essential in the treatment of various forms of surgical tuberculosis, and, since the time of Dettweiler, at least, has also been considered of paramount importance in the management of pulmonary tuberculosis. Murphy, with the surgeon's point of view, more than twenty years ago suggested that the patient with an acute tuberculosis of the lung should be treated as a typhoid fever patient[1], and this method of treatment has recently been carried out to the last detail by Paterson at the Brompton Hospital Sanatorium at Frimley. The latter, however, has little regard for the actual rest of the lung, but endeavours by rest to control the absorption of poisons, which restrain the body's production of defensive substances.[2]

A number of clinicians throughout the last century recorded cases of recovery from phthisis following spontaneous pneumothorax, and it was also noted that interference with pleural effusion was not infrequently diastrous. Carson,[3] of Liverpool, in 1822, mentioned cases of traumatic pneumothorax, incurred in war, curing an existing phthisis. From experiments on animals he concluded that the lung may be collapsed with impunity and suggested that phthisis might be most successfully treated by surgical means. He also suggested that pulmonary hæmorrhage would be as readily controlled by collapse of the lung as the flooding after

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Read before the Toronto Academy of Medicine, April 14th, 1914.

parturition would be by contraction of the womb. Barr[42] states that Carson along with Bickersteth did actually treat phthisis by opening the pleura. About ten years later Ramadge[4] punctured the pleural cavity for the treatment of a case of phthisis. After two years the patient was doing well. Cayley,[5] in 1885, caused a lung to be collapsed for pulmonary hæmorrhage. Five days later the patient died, but the hæmorrhage did not recur. Forlanini,[6] of Pavia, because of the sometimes beneficient influence of spontaneous pneumothorax and pleurisy with effusion in phthisis, suggested in 1882 the production of an artificial pneumothorax by injecting gas into the pleural cavity to produce a similar splinting of the lung, but he did not actually induce collapse of the lung until ten years later.[7] Murphy,[8] of Chicago, independently originated a similar method of treatment, results of which he published in 1898. His pupil, Lemke,[9] published a large series of cases the following year. Until 1906, Forlanini[10] had only treated twenty-six cases, and Murphy's method was but little practised outside his own clinic.

Since the publications by Brauer and his co-workers, in 1906 and later, there has been a renaissance in collapse therapy. The literature has become enormous. In two of Brauer and Spengler's publications (1909, 1911) there are three hundred and thirty-nine references to communications on this method and kindred subjects, and five numbers of the *Centralblatt für Tuberculose Forschung* have been published at half yearly intervals, given wholly to reviews of the extensive literature. There is also an International Association devoted to the study of pneumothorax therapy. Excellent articles by Lillingston[11] in England, and Robinson and Floyd,[12] and Lapham[13] in America, brought Forlanini's and Brauer's methods to the attention of the profession in these countries. The first operation was done in England as late as 1910.[14] In 1911, Rothschild,[15] of San Francisco, stated that the had already used the method in eighteen cases of hæmoptysis. In 1912, McKinnon,[16] of Guelph, Ontario, reported five cases after Murphy's method, the first of which was undertaken in 1900. Collapse therapy is now used by physicians at most of the larger sanatoria and health resorts in Europe, England, and America.

The relatively slow adoption of this therapeutic measure is probably due to several causes, Not the least of these is its name, suggestive of the vivid horror of valvular pneumothorax to anyone who has had experience of such a dreadful event, and of the usual association of pneumothorax with far advanced phthisis and resulting death. The emphasis laid upon the danger of a very simple operation by occasional sudden fatalities, caused by gas embolism or by pleural reflex, has, perhaps fortunately, been a deterrent to its wide adoption until the means for avoiding these dangers have been learned by experienced investigators. The limited number of cases for whom the treatment is suitable, according to the prescribed though still debatable indications, the difficulties in the selection of cases, and the uncertainty of its accomplishment and result, are still other reasons for its tardy adoption. It must also always be remembered that artificial pneumothorax has been obliged to win its place in the treatment of phthisis in the very class of patients with whom all other measures have failed.

Forlanini believed that an artificially produced pneumothorax of sufficient volume and pressure to put a phthisical lung completely at rest would stop the disease. He insisted, however, that the immobilization must be complete and unbroken, as partial reduction in mobility may further the spread of the disease. Further he thought that the increased mobility of the untreated lung might exert upon it a favourable prophylactic or even curative influence.[17] The experience of twenty-two years has justified his anticipations. The good effects are directly due to the compression of the affected lung. As a result of this, there is complete or relative immobilization of the lung. The degree depends upon the absence or presence of thick walled cavities or adhesions, the restraining effect of the latter being dependent upon their site. In a complete compression the lung lies upon the spinal column in a spleen-like mass. In Saugman and Hansen's[18] cases complete compression was obtained in only 15 per cent. Graetz[19] finds that in a few months, in the fibroid type, there are marked fibrous changes, especially in the parts subject to greatest compression, the periphery, and around the vessels and bronchi. Pneumonic, as well as older caseating areas, become encapsulated. There are relatively few bacilli found in the lesions. The pleura may be much thickened. The pneumonic type of case after a much longer period shows much less pronounced fibrosis. The atelectatic alveoli are not obliterated, but there is a change in the character of the epithelium. The pathological condition is retrogressive, but complete cure could not take place in the time in the cases reported. No fresh tubercles were found in the bronchial glands. Mixed infection can pursue an indolent course.

The formation of sputum and the danger of its aspiration are lessened. Experimentally the circulation has been shown by

Bruns[20] to be much diminished and there is a stasis of poorly aerated, venous blood, with resulting sluggish lymph stream, which favours the formation of connective tissue. The absorption of toxic material is also reduced with improvement in the general condition. The consequent increase in immune-bodies, shown by an improved opsonic index (Pigger,[21] Colebrook[22]) permits secondarily an improved local resistance.

In contrast the other lung shows no such fibrosis.[19] It becomes enlarged, elongated, and emphysematous.[18] The right heart hypertrophies because of the diminished vascular area and the loss of the pump action of the lung.[20] The wall of the right ventricle was 7 mm. thick in a case of Carlstöm's.[23]

Reëxpansion of the lung frequently takes place, but the possibly thickened pleura and the fibrous bands formed may keep it from again becoming a functioning organ. Not a single one of Murphy's cases (mostly early) failed to expand. In one case of Spengler's normal reëxpansion took place after seven years.

The cases Forlanini[17] now considers suitable for this procedure are: (1) Uncomplicated, unilateral, slowly progressive cases with free pleura, of any degree of lesion. In these the treatment is easy, relatively brief, and effective. (2) Similar cases with separable adhesions. With these there are great difficulties and the treatment is long continued. (3) Bilateral cases, not acute, with the disease not advanced on both sides. In this group results differ with the degree of the lesion of the untreated lung.

Murphy[1] urges compression in the earliest stages of the disease where there is no absolute contraindication. "It is exactly the appendix proposition over again." Brauer's[24] great work has been confined to a rigidly selected group of severe cases, with but limited, relatively inactive disease in the other lung. Where approved hygienic-dietetic methods and tuberculin have failed, lung-collapse has had many triumphs, and many of those who practise the method have been induced to try forlorn hopes, sometimes with surprising success. Excepting Murphy's, all reports deal with advanced cases. All writers urge the treatment for an earlier type of case than that hitherto practised upon, viz., the moderately advanced case, when there is not prompt response to conventional methods of treatment. Floyd[25] would exclude all early cases, except those of rapid progress under the best of sanatorium conditions, because of the possible complications to which the subject of compression is liable. Davies[26] regards no case, so long as it is progressive, as too early for treatment by collapse. He allows a maximum of three months for medical treatment to show definite improvement. Unless this takes place, or if progress of disease is suspected at any time, and is confirmed by skiagraph, collapse of the lung should be immediately attempted. Severe and recurrent hæmoptysis is generally considered an urgent indication without special regard to the degree of the lesion. In unsuitable cases the compression need not be long maintained. Recurrent pleurisy with effusion and chronic tuberculous empyema are suitable, and lung abscess and bronchiectasis of not too long standing are permissible for the treatment. In caseous pneumonia opinion is divided as to the value of compression. Renon[27] strongly urges its early adoption in acute cases, while Forlanini finds that a similar condition is likely to develop on the other side. For distressing symptoms, such as fever, excessive cough and expectoration, compression may sometimes be successfully used to give relief, without any hope of arresting the disease (Dunham and Rockhill[28]; Voorsanger[29]).

A case otherwise suitable should never be refused the treatment because the history or examination may suggest the improbability of success. Cases which because of probable adhesions seem most unpromising may permit easy collapse. The degree and efficiency of the collapse will depend upon the site and kind of adhesions. Lateral adhesions are worst, diaphragmatic next, and apical ones matter least. In about one fourth of the advanced cases adhesions make compression impossible.

The percentage of cases in the advanced group for which the treatment is entirely suitable is a small one, as strictly unilateral advanced cases are rarely, if ever, found. The suitability of a case for treatment by collapse, apart from the desirability of the treatment, must be determined by the ability of the other lung to take up the compensatory work thrown upon it. Can it stand the strain without latent disease becoming active, or active disease becoming worse? Will active disease be more benefited by the improved general condition, lessened toxæmia, and better blood supply than harmed by the greater mobility? Early disease may be checked by the increased movement, if at the apex, but may be spread if central or basal. That immobilization of an extensively diseased lung will arrest a beginning process in the opposite lung is the experience of Robinson and Floyd, and corroborates that of Brauer and others. In some cases coming newly under observation it may be difficult to be sure that the patients have already passed beyond the possibility of relief by more conventional methods. Delay for observation of the better lung is advised before a pneumothorax is induced. But procrastination may be disastrous. We believe that we have found it so. The extent of disease allowable in the better lung may be placed approximately at one third of the lung. The character of the disease and its activity will, of course, modify this approximation. The better lung may seem worse than it really is because of modified breathing and adventitious sounds conducted from the other side. V. Muralt[30] urges the consideration of this possibility and remarks upon the not infrequent apparent improvement of the better lung immediately after a pneumothorax is established. When half of each lung is diseased and the patient is losing ground Lillingston[31] considers compression justified. The activity in the healthier lung may possibly only be determined by compression of the other lung. In face of some reawakening of activity, Lillingston would not be deterred too lightly from pursuing the treatment. Alternate compression of the two lungs for a period has been successful (Forlanini[32]), and both lungs have been subjected to a moderate degree of compression simultaneously in desperate cases with apparent relief (V. Adelung[33]). It is also to be considered whether the worse lung is really of any value as a respiratory organ. Readjustment of the mediastinum by compression of a useless lung may help rather than harm the patient apart from lessening the toxæmia.

Next to be considered is the ability of the heart to stand the extra strain. The condition of its muscle is therefore of great importance. If the kidneys are diseased a lung collapse must be very cautiously undertaken.

Contraindications, or at least debatable conditions, are numerous in the losing class of the tuberculous. As already suggested, the extent, site and activity of disease in the better lung may make compression quite undesirable. Tuberculous laryngitis may be improved by the lessened irritation from decreased cough and expectoration. Saugman's cases, however, did badly. Cases of severe intestinal tuberculosis can gain but little. Less severe cases may benefit by the improved general condition and lessened opportunity for further infection. Miliary tuberculosis is unsuitable, and the pneumonic form of phthisis is debatable. Successful results have been reported but the same type of disease may develop on the other side. Pregnancy has not been necessarily a contraindication (Real[34]). In infancy and early childhood the results may be excellent (Pielsticker and Vogt[35]).

The complete compression demanded by Forlanini as necessary has been less arbitrarily maintained by Brauer and others with benefit to the patient. Saugman and Hansen support Forlanini in the view that incomplete compression favours the progress of disease. Improvement of symptoms only rather than an arrest of the disease, may be anticipated from partial compression. The action of pyogenic organisms is not stopped. Consistent exclusion of the lung from respiration is obviously impossible. Saugman and Hansen found that only in 15 per cent. of their cases could the lung be completely compressed. The duration of the compression is difficult to determine. A long time is certainly necessary to effect cure in any tuberculous condition, in any case, and type and extent of lesion will modify greatly. Relapses have occurred even after a long period of compression. Occasional refills are not onerous. From one and a half to three years, at least, will be found necessary.

With many handicaps and limitations the results of artificial pneumothorax have been remarkable and often dramatic. After satisfactory collapse has been obtained a relief of symptoms is usually prompt. Fever ceases entirely or becomes much reduced; cough may stop entirely; sputum lessens and changes in character rapidly; bacilli often quickly disappear; the tendency to hæmorrhage is lessened; there is marked improvement in blood condition (often a compensatory plethora[36]); night sweats cease; dyspepsia usually improves; gain in weight may be slow at first, but is often rapid; the improvement in well-being and mental condition is marked; and all this in a relatively short time. Results cannot well be given statistically. The total number of deaths in such a handicapped group of cases must naturally be large. Tuberculous complications will take their toll independent of the pulmonary condition. About a thousand cases have been reported in more or less detail with symptomatic cure in 40 per cent. (Taussig[37]). Standards of selection have varied, many hopeless cases have been operated upon merely to give the patient a chance of relief or improvement, and futile attempts at producing collapse have been included. Forlanini[73] declines to tabulate his one hundred and sixty-three cases. Triumphant recoveries have been obtained in otherwise hopeless cases. In two cases he obtained recoveries after alternate compression of both lungs. Brauer and Spengler[24] report one hundred and two cases, rigidly selected, of hopeless outlook. The many saved they count pure gain, twenty-six others were abandoned.

Spengler[38] has reported fifteen cases of this series which conform to the following severe conditions and show the permanency of result to be obtained by this effective treatment: the pneumothorax had been discontinued at least nine months (all cases had come under treatment more than two years previous to the report); fever, cough and sputum were absent (or if there were sputum it was free from bacilli); all patients were fully capable of work. Before operation twelve of the cases were hopeless and three of bad prognosis. The length of treatment ranged from two to twenty-four months and treatment had been discontinued for from nine months to four years.

An earlier report on eighty-seven of these cases has been analyzed by Rhodes[39] and he classifies them as seventeen apparently arrested, thirty-nine greatly improved with favourable prognosis, fourteen improved (some had misadventures), seventeen no good result; twenty-one in all were dead.

Hansen[40] reports the first one hundred of Saugman's cases, most of whom had undergone sanatorium treatment. In thirty-one, adhesions prevented collapse; in twenty-four, pneumothorax was induced as a last resort or as a relief measure, in forty-five bilateral cases the treatment had lasted at least a year and a half. The first group gives a fair control for the last group, as in extent and activity of disease the groups were comparable. The results in twenty-five of the former were: improvement in six, no improvement or progress of disease in nine, death in ten cases. The forty-five treated cases showed continued improvement in twenty-five, no improvement in two, and progress of disease in four. In several other cases there was temporary improvement. Twelve of the forty-five patients were dead. The sputa of all the patients at the beginning of treatment contained bacilli, which disappeared from the sputum of three untreated cases and from that of twenty-one of the treated patients.

Robinson and Floyd[11] report twenty-eight cases, with arrest of disease in eight, and relief of symptoms in twenty. Hamman and Sloan[41] report twenty cases. In three compression was impossible; in three collapse was followed by serious complication or death; of seven incomplete compressions there was marked improvement in three; and of seven complete compressions there was general improvement in all. As an urgent measure in hæmoptysis reports of the effectiveness of compression by Rothschild, Lillingston, Hoelmboe, Thue and others, are highly satisfactory. Adhesions may, of course, make compression impossible, as may other grave contraindications.

We have tried during the last year and a half to induce pneumothorax in twenty-four cases. These do not include six patients with serous pleural effusion, in whom partial compression was maintained for a short time by replacement of the fluid with air or nitrogen after Barr's[42] method of treatment of effusion. All twenty-four cases had bilateral disease, four were moderately advanced and twenty were far advanced. A good displacement by nitrogen was obtained in twelve cases, unsatisfactory displacement in nine cases, and no gas could be introduced in three cases.

In three cases the treatment was undertaken for the control of severe recurrent hæmoptysis. The hæmorrhage was promptly controlled in one case, and the pneumothorax was maintained at no great volume for a number of months because of previous severe recurrent hæmorrhages. A new outbreak of hæmorrhages which occurred six months later could not, however, be controlled by compression, probably because of a relatively incompressible apical cavity, and the pneumothorax was abandoned. In another case compression stopped the hæmorrhage at once, and, as the better lung was but little involved, the pneumothorax has been maintained as a curative measure. After six weeks this patient developed a slight effusion on the treated side. A third case could not be compressed because of adhesions.

Five cases were entirely suitable for pneumothorax as regards the limited lesion of the better lung, but in three only was a satisfactory compression obtained. One, because of history of pleurisy and marked displacement of the heart, gave little promise of collapse, but a satisfactory compression was obtained without difficulty, bacilli disappeared from the sputum in three months' time, and a hopeless invalid has been transformed into an apparently arrested case. The erythrocytes are now 7,500,000 per c.mm. The pneumothorax has been maintained eighteen months. Another case, moderately advanced and progressive, made dramatic improvement immediately following compression. After five months the patient left to continue treatment elsewhere. He died a month later from the effects of severe facial erysipelas. During or after the attack a purulent effusion developed in the pneumothorax cavity. A third case recently operated upon gives every promise of a satisfactory result. The disease is of five years duration and there is a history of repeated hæmorrhages. The initial inflation caused great pain and distress because, presumably, of easily separable adhesions. Subsequent inflations have caused no distress whatever. A fourth case could not be compressed because of adhesions. After the injection of 300 c.c. of gas at 20 cm. actual water pressure mediastinal emphysema developed. The terminal pressure was 10 cm. water. After an intermission of three weeks the same thing happened again. In a fifth case with adhesions gas escaped into the lung after the third inflation. The terminal mean pressure was only 3 cm. water manometer. A large cavity was close to the gas bubble of 700 c.c.

Two other patients, in whom the better lung was in apparently satisfactory condition and in whom satisfactory compression has been obtained, have complications which make the prognosis more doubtful. One has tuberculous laryngitis and the other a tuberculous empyema. In the latter case nitrogen replaced 130 ounces of pus (containing many tubercle bacilli without pyogenic organisms). Both patients, though under treatment but a short time, one and three months respectively, have been materially improved.

A satisfactory compression was obtained in five cases of progressive disease in which the lesion of the better lung makes the outcome very doubtful. In all there has been a marked improvement of symptoms. In two the physical signs of disease in the better lung have materially improved. The local and constitutional improvement of one case was dramatic and has continued for eight months.

The treatment was undertaken in seven other cases with the hope that, if accomplished, it would afford some symptomatic relief, but it has been abandoned in all but one of these cases. It was anticipated with all that the presence of adhesions would prevent effective compression and while a gas cavity was formed in every case, in none has a satisfactory compression been obtained. With one patient gas escaped into the lung during the fourth inflation after 400 c.c. had been introduced at 37 cm. pressure. Death occurred a few days later, presumably uninfluenced by the mishap. This was a forlorn hope, and one of our earlier cases. In another patient gas escaped into the peritoneal cavity during a third inflation after 600 c.c. had been previously well borne at 8 cm. pressure.

In two other cases, undertaken for the compression of cavities, no gas could be introduced. With one of these the needle entered a blood vessel, shown by a gradual rising pressure on the manometer and the appearance of blood in the filter.

We have made two hundred and twenty-two punctures and one hundred and eighty inflations. No symptoms due to pleural shock or gas embolism have been noted. The misadventures have been noted above: escape of gas into the lung in two instances, into the mediastinum in one, and into the peritoneal cavity in one. Two patients suffered much pain during the separation of apparently trifling adhesions and three had a good deal of pain during the separation of adhesions under pressure. The highest pressure used was 40 cm. actual water pressure. Symptoms following the inflations have been irregular and trifling as a rule. There has been sometimes pain in the chest lasting some hours, some sense of tightness, slight dyspnœa, temporary increase of cough and expectoration, slight staining of the expectoration with blood, slight rise of temperature, referred pain in the neck and at the articulation of the jaw, supra-orbital neuralgia, sense of abdominal tension. The occasional subcutaneous emphysema sometimes caused slight soreness, the mediastinal emphysema slight discomfort and pain on swallowing, the subdiaphragmatic emphysema a sense of tension in the epigastrium for a day or two. The only complication has been a slight effusion in one case under treatment less than two months.*

The better lung has improved thus far in five of the twelve cases in which a large pneumothorax has been obtained. The apparent prompt improvement in one rather bad better lung was probably due to the lessening of conducted sounds from the compressed lung. In one patient the outcome regarding the better lung is at present doubtful. In one case (hæmoptysis) there was some reawakening of activity, pleurisy especially, on the better side, and the pneumothorax was abandoned.

In one case only was an efficient compression produced in spite of adhesions making compression difficult at the start. This was the exception to the rule that when a fairly free pleural cavity was not found at once a satisfactory compression could not be obtained. In three other cases at least adhesions gave way later allowing an increase in the size of the cavity.

This work has been necessarily undertaken without the help of the *x*-ray. In five cases only radiograms have been obtained some months after the pneumothorax was induced. The lack of this help has been keenly felt, but the procedure may nevertheless reasonably be undertaken without it.

The results of our work, although we have so far induced collapse chiefly in very bad cases and have made some vain attempts, are such that we feel enthusiastic about the treatment and its possibilities, much more, indeed, than might be inferred from the cold analysis here given. But anyone who undertakes this work must be prepared for many disappointments as well as for dramatic and unexpected successes.

(To be continued)

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*At date of publication effusions have developed in seven out of fifteen cases with effective compression, after two to twenty-two months of treatment, while with us or subsequently.

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VACCINES IN THE TREATMENT OF BACTERIAL DISEASES OF THE LUNGS COMPLICATING PULMONARY TUBERCULOSIS AND THEIR PREPARATION

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THE pathogenic bacteria of the respiratory tract are usually referred to as producing "secondary infections" to tuberculosis, whereas it has been suggested that they may be frequently the primary invaders predisposing lung tissue to implantation with tubercle bacilli, and a better term would be "mixed infections."

It is evident that they are the predominating infection in certain cases of pulmonary tuberculosis, and that they may produce the toxic symptoms to a large extent. This may account for the rapid subsidence, in a certain number, of cases of physical signs, which, if due to tuberculosis alone, would have made the prognosis grave. Nearly every sanatorium physician has seen cases which, on entrance, present marked physical signs but clear up so rapidly under the ordinary *régime* of rest, fresh air, and diet, as to compel him radically to change his idea of the amount of tuberculous involvement.

Allen's[1] experiments on the cultivation of tubercle bacilli *in vitro* in the presence of the toxin of certain of these secondary organisms showed an increase in the former's growth ten million fold. In obtaining rapid and luxuriant cultures of tubercle bacilli, advantage is taken of this fact and "pneumotoxin" and "streptotoxin" glycerine-agar are used as media. Surely symbiosis can take place in the lung tissue, and the presence of other bacteria augment the growth of tubercle bacilli. Some cases presenting marked catarrhal symptoms have been found, on clearing them of the secondary bacteria with autogenous vaccines, more easily to take care of the tuberculous infection.

Vaccination Difficulties. It has been intimated by an authority[2] that the discouraging results of vaccine therapy in the hands of a number are due to faulty technique in their preparation.* There is much careless work done in the preparation of vaccines, and nearly every small hospital at the present time has a laboratory where they are frequently prepared by a poorly paid and incompetent laboratory worker; often a man doing practice "part time," or one with no medical training.

In discussing this subject, Theobald Smith[3] says: "It is obvious that from what has been said, vaccination in the course of disease is not a matter to be taken lightly. Each case presents its own peculiar problems which must be studied, not only that vaccines may achieve a possible success, but that they may do no harm. The one who administers vaccines or advises their use should have thorough training in experimental and comparative immunology. Not only should he be on terms of intimate personal acquaintance with the facts and theories of infection and immunity, but he should know how to prepare and evaluate the vaccines to be used. I therefore agree with Wright that we need vaccinators who should be specially trained and work in co-operation with the clinician. We can hardly expect a physician to be both a vaccinator as defined, and a skilled all-round clinician, but we can have a co-operation of two men sharing the responsibilities involved in these lines of work."

PREPARATION OF VACCINE FROM SPUTUM. As the preparation of vaccines from pathogenic organisms in the sputa is attended with the most difficulty, I shall describe with some detail the method of obtaining the same: Before breakfast the patient is instructed to brush the teeth and cleanse the mouth well, using hydrogen peroxide diluted one to four with boiled water, followed by a thorough rinsing and gargle with the sterile water, of which a mouthful or two is swallowed. The sputum is raised with a cough, if necessary, and expectorated into a recently sterilized wide-mouthed two-ounce bottle, when it is immediately corked, care being taken to avoid touching the neck of the bottle with the fingers. The sooner the specimen is washed and cultured after collection, the better, preferably within two or three hours. Six Erhlenmeyer flasks of 150 c.c. capacity, or the same kind of bottle as used in collecting the specimens, are boiled for ten minutes in a closed boiler, when they are allowed to cool and one-third filled with sterile distilled water. Smears are made from the lump of sputum which is emptied into the first flask and skaken until several pieces the size of a pea are washed free from the mass. These are transferred, by an ordinary sterile pipette, drawn from quarter-inch glass tubing, to the second flask and shaken. The particles are thus transferred to each flask in succession and when in the last, should be about the size of rice bodies. On transferring, care should be used to carry over as little of the wash-water as possible. When in the last flask, a piece of gauze, moistened in 5 per cent. carbolic solution, is placed over the mouth until ready to culture. Three tubes of plain agar are melted for each specimen, and cooled down to 42° or 43° C. To two of them add enough blood collected aseptically from an arm vein into 2 per cent. neutral sodium citrate solution, so that the melted agar is a rich red colour. Transfer one of the particles directly to one of them and plate; to the other, several drops of the broth which was inoculated with a sputum particle; a third tube is poured plain.

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*In this article, autogenous vaccines are alone considered, inasmuch as it is generally acknowledged that their use is far more logical and scientific than the polyvalent stock vaccines.

After incubation for twenty-four hours at 37° C., the hæmolytic colonies are plainly seen in contrast with the others. It is best on transferring colonies to use artificial light. For this, the writer has devised a three-legged heavy brass-wire stand holding a clear glass plate, underneath which is an electric bulb. If the colonies are small and the original smears showed pneumococci, or streptococci, six tubes should be inoculated from each different colony in order to insure sufficient growth in twenty-four hours for a vaccine. When the sub-cultures show enough growth, they are studied by Gram's method and compared with the original films. If pure cultures, 2 or 3 c.c. of normal saline is poured over the slant, and the growth separated from the agar, being very careful not to scrape off any of the latter. The emulsion is transferred by means of a pipette to another strong test tube containing some fine sterile glass beads or broken particles of glass. The tube is sealed in the flame and when cool, shaken well until all coarser clumps of bacteria are broken up. It is then placed in a water thermostat at 56° for one hour.

To Standardize Vaccine. Take a capillary pipette and mark off three arbitrary units of 1 to 2 cm. in length. Prick the finger and draw up one unit of blood. The tip of the emulsion tube is broken off and a unit or more of the bacterial emulsion is then taken up, after which a small quantity of citrate solution. The whole is expelled on a clean slide and mixed thoroughly by drawing it up and down into the pipette several times. Films are made and stained by Wright's method. Place into the eye-piece of the microscope a piece of paper into which has been cut a small rectangular opening. This gives a field which can be mentally divided into squares for counting. The bacteria and red cells are counted separately in sixteen fields of two slides each and averaged, taking into account the dilution. The formula $\frac{5,000,000 \text{ x No. of bacteria}}{\text{No. of red cells.}}$ gives the number of organisms in a cubic millimeter of the emulsion, and by adding three ciphers, the number in 1 c.c. The dosage of the particular organism per c.c. is then decided, and 20 c.c. of a dilution made accordingly. As an example, if the emulsion was of pneumococci, multiply the maximum dosage given in the table following, by the total amount of vaccine required or 20 c.c., and divide by the number of bacteria in 1 c.c. of the stock suspension to get the quantity of the latter to use, which is then diluted up to 20 c.c. with sterile normal saline in 0·25 per cent. carbolic solution.* If there are more than one organism, the same procedure is followed but the amount of the concentrated suspension used is taken into account when diluting to the amount required. The vaccine is placed in sterile 20 c.c. Wright's vaccine bottles with rubber caps, which are sealed on with paraffin, and then kept in the ice-box. Before using, the cap is wiped with pure lysol or dipped into strong carbolic solution. The bottle should be thoroughly shaken before the needle† is inserted and the vaccine withdrawn. The vaccine is tested for sterility on two successive days by inoculating plain agar, before used. Subcutaneous injections are usually made in the arm, alternating the latter if tuberculin is simultaneously used.

DOSAGE. The following dosage table is one for chronic cases, modified from Martindale and Westcott.[4]

Microörganism	Approximated Doses	Repetition of Doses
B. septus	100 million to 500 million	5 to 7 days
B. Friedlander	100 " 500 "	7 " 10 "
B. influenzæ	100 " 1000 "	7 " 10 "
M. catarrhalis	100 " 1000 "	4 " 7 "
Pneumococcus	75 " 500 "	7 " 10 "
Streptococcus also S. salivarius	25 " 500 "	7 " 10 "
Staphylococcus	100 " 2000 "	4 " 7 "
M. paratetragenus also M. tetragenus	50 " 500 "	4 " 7 "
Diphtheroid B	50 " 500 "	7 " 10 "

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*Extra pure fused crystals of sodium chloride and carbolic acid crystals are used.

†The 1 c.c. Record Syringe with fine No. 14 short iridio-platinum needle is best.

No fast rule can govern the initial and subsequent dosages; clinical symptoms have been found most valuable in directing them. The age, physical condition, stage of tuberculous involvement, chronicity of infection, are all factors to be considered. Weight observations are of value especially when tuberculin is being given on alternate injections. The same rules govern the dosage as those for tuberculin. A frank local reaction characterized by hyperæmia at the point of inoculation, with tenderness and probably slight swelling, and without constitutional symptoms, indicates a decrease or continuance of the same dose. If accompanied with slight constitutional symptoms as headache, malaise, anorexia, slight rise in temperature and increased pulse rate, the inoculation is omitted once and the subsequent dosage is reduced to several degrees lower in the scale.

Chest examinations were made once or twice a month, and sputum specimens called in frequently to note if there was any decrease in either the secondary organisms or tubercle bacilli.

If after several weeks there is no improvement in the condition of the patient clinically, or in the bacterial count or quantity of the sputum, the administration is discontinued. It has frequently been noticed that in the more chronic cases, from four to six weeks treatment was required before beneficial results were noticed. Results seem to have been more apparent where the early doses were increased rapidly to the point of a local reaction and an effort made to maintain the dosage just beneath this threshold. Cases which stood tuberculin well could, as a rule, be treated simultaneously with another vaccine for the secondary invaders. By a careful study of the physical signs and symptoms, one could to a degree determine the secondary invading organisms complicating the disease.

Staphylococci, being lytic, are very frequently found in those chronic cases with cavity formation, limited toxic affect and low pyrexial symptoms, but the organism is low in its acceleration of the growth of tubercle bacilli.

The *pneumococcus*, containing both endo- and exotoxins but showing some lysis, produces more marked toxic affects and less of cavitation. It is next to the streptococcus in its accelerating power of the growth of Koch's bacillus.

The *catarrhal group* of Gram-negative diplococci, represented by the M. catarrhalis, with no lytic power or exotoxin, produce catarrhal symptoms principally and with slight pyrexial symptoms.

There may be some excavation. The group stands about fourth in its power of stimulating the growth of tubercle bacilli.

B. influenzæ with its powerful endotoxin, produces marked pyrexial symptoms but little of excavation, and it ranks next to the pneumococcus in activating the growth of tubercle bacilli.

The severity of the infection would depend on whether one or more of the secondary organisms were present.

The results of a study of the flora of the sputa of one hundred and six cases, together with their principal clinical manifestations, and in the order of their frequency, are given below. Variation in the flora will frequently occur during the immunization process, so that repeated examinations are made and a new mixture employed if necessary.

Sputum Examination of One Hundred and Ninety-six Patients

Organism	Occurrence		Chronic Manifestations When Predominating
	Cases	Per cent.	
Staphylococcus	115	58·7	Tendency to cavitation. Slight temperature. Prolonged chronicity.
Pneumococcus	104	53·	Bronchitic and asthmatic.
Strept. salivarius	43	21·9	Bronchitic and asthmatic.
M. catarrhalis	42	21·	Chronic catarrh of whole respiratory tract, frequently of the accessory sinuses and with pyorrhea.
B. septus	29	14·8	None.
Friedlander's pneumobacillus	21	10·7	Nasal catarrh.
M. tetragenus	8	4·1	Bronchial catarrh or none.
Diptheroid organism	5	2·5	None or toxic symptoms.
B. influenzæ	5	2·5	Nasal catarrh. Frequent complication with sinus disease.
M. paratetragenus	2	1·	Bronchial catarrh.
Strept. maximus	1	0·5	Asthmatic and bronchitic.
Strept. longus	1	0·5	Asthmatic and bronchitic.

It seems that the predominating bacterial flora of the respiratory tract of sanatorium cases differ in different localities. It is interesting to note that in the majority of streptococcal infections, the clinical manifestations were the severest and the asthmatic element predominated.

Several cases in this group are of sufficient interest to report somewhat in detail: Mrs. W., aged thiry-eight years, housewife.

Usual diseases of childhood. Past four years has had "occasional" attacks of asthma. About a year before entrance, the acute attacks were more frequent, occurring less than a month apart. She was losing in strength and coughed considerably. Physical examination showed her to be fairly well nourished. There was marked asthmatic breathing. Circulatory system negative. Chest: right side, impaired resonance at apex extending to third interspace anteriorly and to the level of fifth dorsal spine posteriorly. Breath sounds harsh with prolonged noisy expiration. Coarse sibilant ronchi heard everywhere front and back which marked the other auscultatory signs. Left: impaired note at apex. Broncho-vesicular breathing with an occasional coarse sibilus. Sputum examination showed tubercle bacilli (Gaffky iv), and many hæmolytic, Gram-positive non-liquefying streptococcal chains. Weight on entrance 106¾ pounds. After a month of the usual treatment of rest, fresh air and diet, during which time her temperature ranged in the afternoon from 99° to 101°, she showed slight improvement. Her weight was 110¼ pounds, and she still had the acute asthmatic attacks.

A vaccine was made and increasing doses were given bi-weekly until there was a severe local reaction, and slight rise in temperature. Her dyspnœa was much less marked after five weeks treatment, and her temperature occasionally rose to 99°. Sputum examination showed the tubercle bacilli to be less, but still many streptococci present. When the time came for the recurrence of the asthmatic attack, it was much less severe and shorter in duration. Her breathing was noticeably freer. After three months steady treatment her temperature showed an occasional slight rise above normal. Weight 118½ pounds. Breathing free. No recurrence of asthmatic attacks. Physical examination showed absence of the coarse sibilant râles, but there persisted post-tussic crepitations to the second interspace in front and the level of the fourth dorsal spine posteriorly. There were a few fine post-tussic crepitations at the left apex. Repeated sputum examination showed no streptococci and an occasional tubercle bacillus.

Two other patients with somewhat similar history showed long-chained streptococci. The one, a very obese woman aged forty-five, suffering considerably from an acute asthmatic attack on entrance, was referred by Drs. Irving and Murphy, of Kamloops, and had been in this climate for some time. Sputum contained tubercle bacilli. Heart negative. Some tuberculous infiltration at left apex. Adrenalin injections failed to relieve the acute attacks. After a month's treatment with a homologous vaccine, her asthmatic attacks were less frequent and severe, but sufficient time has not elapsed since commencing the inoculations to report in full. The other patient, a man, aged thirty-eight, from Vancouver, entered with marked asthma and negative sputum, and with few physical signs of any active tuberculosis. Von Pirquet positive. Circulatory system negative. The sputum contained long streptococcal chains whose colonies were hæmolytic. A vaccine was made and the patient seemed to respond favourably after several inoculations. His sleep became less disturbed at night, and his breathing more free. On auscultation an occasional ronchus was heard, but the physical signs to date had cleared up to a great extent.

I wish to emphasize the fact that vaccine therapy of secondary infections is only an adjunct in the treatment of pulmonary tuberculsosis, and that the primary treatment in all these cases is rest, fresh air and diet, with tuberculin in suitable cases; that certain cases will improve much faster under this treatment and that it has been the turning point of the disease in some. As an authority[5] states, "vaccines applied during disease will be rarely, if ever, life saving, but they may hurry a stationary or languid process which tends towards recovery, by bringing into play the unused reserves of various tissues."

Conclusions

1. It is evident that in a certain number of cases of pulmonary tuberculosis, the secondary organisms play an important rôle. They may be the primary infection predisposing to tuberculosis, or their presence may accelerate the growth of tubercle bacilli to such an extent that a better term for these cases would be "mixed infections."
2. The discouraging results of vaccine therapy in the hands of many are due to faulty technique in their preparation and administration.
3. As the preparation of homologous vaccines from the sputa of tuberculous cases is attended with difficulty, a practical and efficient method for obtaining the same is described.
4. Most of the secondary infections are chronic, and although a dosage table can be referred to, no arbitrary rule can govern the administration of vaccines. The age, stage of tuberculous involvement, chronicity, physical signs, etc., are all determining factors.
5. Frequent chest and sputum examinations should be made during the treatment, and the vaccine modified as indicated.

6. The character of the invading secondary organisms can, in a measure, be determined by their clinical manifestations.

7. In an examination of the sputa of one hundred and ninety-six patients, the pyogenic organisms predominated and their frequency was noted. The hæmolytic streptococcal group usually manifested the severest clinical symptoms, and asthma was frequently present. This group responded particularly well to vaccines.

8. Vaccine therapy of secondary infections complicating pulmonary tuberculosis is a valuable aid in the treatment, when used with rest, fresh air, and good food, or in connexion with tuberculin in selected cases.

References:

1. Allen, "Bacterial Diseases of Respiration and Vaccines in Their Treatment," H. K. Lewis, London.

2. Allen, *loc. cit.*

3. Smith, Theobald, "An attempt to interpret present day uses of vaccines," *Journ. A.M.A.*, May 24th, 1913, p. 1599.

4. Martin and Westcott, "The Extra Pharmacopœia," 15th Ed., H. K. Lewis, London.

5. Smith, Theobald, *loc cit.*

The following prescription, attributed to a certain Dr. Cannon, has been widely recommended as a sure cure for the German measles:

Mix some Woolwich powders with tincture of iron and essence of lead, and administer in pills; have ready a little British army (a little goes a long way), some Brussels sprouts and French mustard; add a little Canadian cheese and Australian lamb and season it with the best Indian curry. Set it on a kitchener and keep stirring until quite hot. If this does not make the patient perspire freely, rub the best Russian bear's grease on his chest and wrap in Berlin wool. As to diet, the patient must on no account have any *peace soup* until the swelling in the head has quite disappeared.

BLOOD TRANSFUSION IN INFANTS AND YOUNG CHILDREN

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A REVIEW of the literature of blood transfusion since the operation was made practical through the experimental work of Crile and Carrel reveals the fact that only within the last two years has it received attention as a therapeutic agent in the management of the various conditions in infancy. Recent clinical experience confirms in many instances the enormous value of the introduction of whole blood into the circulation, and furthermore, it has emphasized its limitations.

The broad indications for transfusion are based on the fact that transfused blood is a perfect substitute for blood lost in acute hæmorrhage. In certain pathological hæmorrhages the blood has definite hæmostatic properties and in some secondary anæmias it acts as a powerful stimulant to tide over a crisis in the disease. Another type of case that up to the present time has received less attention from the standpoint of the possibilities of transfusion is that showing purulent foci such as severe suppurative or infective conditions, as, for example, empyema and pneumonia, both of which tax severely the blood elements and hæmatopœtic organs, producing a secondary anæmia according to the intensity of the process, in this manner lowering the infant's resistance sufficiently to jeopardize life. By transfusion one introduces whole blood and pure complement which carry with them resistance unobtainable in any other form of procedure. In certain pathological hæmorrhages transfused blood has a remarkable hæmostatic effect. The bleeding in these cases is supposed to be due to the lack of certain elements, thrombin and prothrombin, in the patient's blood.

From the wards and laboratories of the Hospital for Sick Children.

Transfusion corrects this deficiency and at the same time restores the blood already lost by the hæmorrhage. In this latter effect transfusion has a distinct advantage over the injection of serum subcutaneously, which has also proved to be valuable in these pathological hæmorrhages. In exsanguinated patients simply to check the bleeding may not be sufficient, transfusion is required to restore the cellular elements of the blood.

In hæmorrhagic disease of the newborn, a disease formerly credited with a mortality of from 50 per cent. to 75 per cent., transfusion stops the bleeding, restores the lost blood and transforms a sick, and often a dying, infant into a normal healthy child. Welch, Schloss and Commisky and others have reported excellent results with the subcutaneous injection of blood serum and whole blood in hæmorrhagic disease, but as is frequently the case, the patient is beyond serum treatment, and in such instances transfusion has been conclusively proven effective.

Infants are susceptible to the effects of hæmorrhage. A baby of eight pounds is estimated to have a total quantity of a little more than six ounces. Since a dog cannot always survive a loss of one half the total quantity of blood, it is fair to assume that the loss of an exsanguinated infant is about one half its total quantity. Thus in dealing with hæmorrhagic disease of the newborn, it is not safe to temporize too long with measures which may check the bleeding after a time, but cannot relieve the anæmia. This advantage of transfusion over serum injections applies with equal force to any case of hæmorrhage in which we have an exsanguinated patient.

Transfusion is less clearly indicated in the secondary anæmias which are not due to the loss of red corpuscles from the body, as in leukemia. The cause of the anæmia is too often a pathological condition which is incurable or not altered by the transfusion of blood. In simple secondary anæmia due to sepsis, and in certain cases of decomposition, the beneficial effect of the transfusion is obtained by increasing the patient's resistance and augmenting the natural forces which combat the progress of the disease. In purpuric conditions of obscure etiology, transfusion is not indicated by the results which have been secured up to the present time. It may prove to have a place in the treatment of purpura when we have a better understanding of the diseases in which purpuric hæmorrhages occur. In many acute infections, general tuberculosis and malignant disease, the negative results are sufficiently definite to show transfusion to be of only temporary benefit.

Embolism, sepsis, the transmission of disease, and even hæmolysis, are of much less frequent occurrence than was formerly supposed. The danger of hæmolysis has been exaggerated by most writers. Crile says that "kinship between donor and recipient is apparently of no special advantage, and the laboratory test may show hæmolysis, and yet the same blood be entirely safe in transfusion." He performed transfusion in eighteen tuberculous cases and in most of these the donor's blood hæmolyzed the recipient's blood in the test tube, but not in the patient. In our twenty-one cases we have seen but one case of hæmolysis after transfusion; this exhibited itself in the form of a slight icterus twenty-four hours after operation, otherwise recovery was complete. In only one instance did we perform the laboratory test which showed hæmolysis, but absolutely no evidence of blood destruction was observed following transfusion.

Properly safeguarded transfusion is not a dangerous operation. The withdrawal of too much blood from the donor and the dilatation of the recipient's heart are usually avoidable mishaps. The introduction of air bubbles both large and small, contrary to the general opinion, have caused absolutely no harm. Experimentally this observation has been confirmed by one of us when almost a syringeful (10 c.c.) of air was introduced into a dog's femoral vein producing only a momentary cyanosis and then complete recovery with apparently no bad after-effects.

The amount transfused may be controlled to a certain extent by the estimation of the hæmoglobin, but it must be borne in mind that the introduction of whole blood acts as a stimulus to the hæmotopœtic organs, with a result that from twelve to fourteen hours following the cessation of transfusion the hæmoglobin may read from ten to thirty points higher. The average duration of the flow of blood in the cannula method is from three to six minutes, while with the syringe method the quantity can be accurately estimated. In a newborn infant from 90 to 120 c.c. is sufficient to stop the bleeding and restore almost half the total quantity of blood. In an infant three months of age, naturally depending on the degree of exsanguination, a larger amount is required. 320 c.c. is the largest amount injected in the syringe method in our series, while Lindemann introduced 280 c.c. in a nine year old child.

Though the operation of blood transfusion is by no means a new one, it has taken many years to reach the present varieties of technique and by no means has the last word on it been said. Over fifty years ago Esmarch practised the method of injecting defibrinated blood into the recipient and various modifications of this method have been used. The procedure, however, has the obvious disadvantage that the whole fresh blood cannot be transferred from donor to recipient. Some thirty years later Von Ziemssen succeeded in transferring whole blood from donor to recipient by means of syringes and hollow needles. For a time this method apparently was not held in great esteem as it was considered that the possibility of clot formation in the needles and syringes represented too great a hazard to the patient. In the last few years the method of direct transfusion, either by end-to-end anastomosis of artery and vein or the interposition of some connecting tube, such as the Brewer tube, was elaborated and further stimulus added to the work. This method, however, requires considerable skill, specially made instruments, and has the disadvantage that the actual amount of blood transfused cannot accurately be guaged.

More recently the transference of whole fresh blood by means of an intermediate vehicle has received a great deal of attention. Of the methods other than the syringe-cannula method which is described below, mention should be made of the Kimpton tube, the apparatus of Satterlee and Hooker with which leech extract has been used as an anti-coagulant; the two-way rubber bulb used by McGrath in experimental work; and the two-way glass receptacle used by David and Curtis for which these investigators claim excellent result in adults.

The method used by us at the Hospital for Sick Children is, with certain modifications, the Von Ziemssen method as revived and improved by Lindemann, of New York. The instruments used are a set of six 20 c.c. ground-glass syringes, four Luer needles, some of which have smooth unbevelled tips, two two-inch rubber tubes armed with metal tips fitting the syringe and needle, respectively, and a set of small dissecting instruments—the last-named to be used when a superficial vein of the recipient cannot be entered by puncture through the skin. In the last transfusion done previous to the writing of this paper, it was found possible to dispense with the metal tip between the rubber tube and the syringe, the nozzle of the latter being introduced directly into the lumen of the rubber tubing. Latterly a special needle has been used similar to a trochar and cannula in which the trochar is grooved throughout its length in such a manner as to produce a small channel through which blood can pass. This instrument may be made to enter a vein through the skin quite easily and the venous pressure causes a drop of blood to appear at the bulb of the cannula between it and the trochar. When the latter is withdrawn the smooth end of the cannula is left in the vein and does not injure the intima as would the pointed bevelled tip of the ordinary hollow needle. All instruments are sterilized by boiling and the syringes, tubes, and needles are lubricated on the inside by washing through them sterilized liquid paraffin.

The following detail applies to the procedure as carried out in young infants, as these constitute the majority of our cases and are the ones involving the most difficult technique.

Having sterilized the skin by painting with 2·5 tincture of iodine, select the most superficial vein in the antecubital region of the recipient's left arm, anæsthetize the skin with a 0·5 novocaine solution, and apply constriction just below the shoulder sufficient to prevent the venous return. With fine dissecting instruments expose and free the vein for a distance of half an inch, ligate it at the distal end of the wound and release the tourniquet. At the point in the vein selected for the entrance of the needle make an oblique opening into the lumen of the vessel—if the lumen is too small to admit the needle, dilate the vessel by introducing a fine pair of curved foreign-body forceps such as used in eye work. Tie the needle to the vein and allow it to fill with blood. A saline syringe with rubber coupling is now attached and a small quantity of salt solution injected to clear the needle of blood.

When the recipient's vein has been entered, a needle is introduced into an elbow vein of the donor and rubber coupling and syringe are attached. If the needle is introduced in a direction opposite to that of the blood stream, it will be found that the syringe as a rule will fill more quickly, particularly if moderate constriction is applied above the elbow as the piston of the syringe is being drawn out.

As soon as the assistant has obtained 20 c.c. of blood from the donor, the blood-filled syringe is passed to the operator who substitutes it for the saline syringe previously attached to the recipient's needle. The injection of blood is made at a moderate rate of speed, and as soon as the syringe is emptied it is immediately replaced by a saline syringe and sufficient salt solution injected to clear the coupling and needle of blood. In the case of the donor a saline syringe is attached and the coupling and needle cleared in the intervals between the successive withdrawals of blood. The time required for filling and emptying a 20 c.c. syringe in this manner should not occupy more than fifteen seconds. In the very small babies we have found it advisable to introduce only about 10 c.c.

of blood at a time, and not more than this amount in the space of a minute. In one of our cases in which the weight was only four pounds and the general condition was very poor, the injection of blood was carried out too rapidly for the accommodation of the circulation, the patient showed signs of sudden overdistension of the right heart and pulmonary circulation, and died in spite of attempted withdrawals of blood both from vein and heart. In older children 20 c.c. a minute may be introduced without much apparent circulatory disturbance, but even this length of time may be increased without disadvantage and with less risk of disturbing the circulatory balance of the patient. In two instances in older children the injection of the first two syringefuls of blood was followed by complaints of pain localized beneath the upper end of the sternum. In one case this was followed by transient dizziness and the procedure was stopped. In the other case the introduction of blood was suspended for five minutes and then resumed, no further symptoms occurring. In both cases the condition was secondary anæmia, and the patient, although having a low hæmoglobin, had no depletion in amount of circulating fluid and the margin of safety as regards increasing the actual amount of fluid in the vessels was smaller than in an exsanguinated patient. The injection of the blood apparently had been made too quickly to allow for the accommodation of the circulation to the increased blood content and the symptoms were due to sudden mechanically increased pressure in the right heart.

Possibly the chief difficulty to be encountered in the younger infants with plenty of subcutaneous fat is in defining, and introducing a needle into, the vein; it is almost impossible in many cases, as for example in hæmorrhagic disease of the newly-born, when it is merely a waste of time to attempt to effect an entrance of the needle into the anterior jugular vein, and it is for this reason that we have used one of the elbow veins. If one does not clear the needle of blood by the introduction of saline, a clot will form, particularly in the bulb of the needle. This occurred in one of our earlier cases and in another case witnessed by one of us. In both cases the clot, however, was much too large to pass through the needle and after removal by forceps no further obstruction occurred. In another case in which the recipient's needle had become roughened on the inside the injection of blood towards the end of the transfusion became more difficult, and after the operation it was found that small deposits of pinkish-white fibrin had formed on the inside of the needle. They were very adherent to the wall of the latter and were removed only by forcible passage of an obturator.

Following transfusion it is quite usual to see an abrupt rise in temperature with an accompanying increase in the pulse rate and possibly some irregularity of the latter. A rigor may or may not accompany the temperature rise, but does not last long and the temperature subsides within a few hours.

As compared with the method of direct transfusion, the syringe-cannula method is very much simpler, a much greater degree of control is obtained and the exact amount of blood is known. In comparison with those methods in which large receptacles are used for the transference of blood it has the advantage that the blood may be introduced slowly, intermittently, and in very small quantities, while in the large receptacles the apparatus is less easily manipulated, and if clotting occurs a great part of the blood may be lost. Most certainly in very young infants its ease of application should recommend it as the method of choice.

The following is a brief synopsis of the series:

1. Hæmorrhagic disease: Four cases, two treated by the glass cannula method, and two by the syringe method. Complete recovery in all, the hæmoglobin being between 7 and 10; amount transfused in second two cases (that is with syringe method) being 120 c.c. while in the first two cases the hæmoglobin was 100 after operation.

2. Secondary anæmia.

   (*a*) Simple: Four cases, all of which recovered. The hæmoglobin, before 27, after 82.

   (*b*) Chronic tuberculosis infection: Six cases, one recovered. The hæmoglobin, before 32, after 76, one died of a general infection later.

   (*c*) Empyema: Two cases, one recovered. The hæmoglobin before 40, after 85, one died six months later of a secondary pneumonia.

   (*d*) Congenital syphilis: One case, died. This case was transfused four separate times, using both father's and mother's radials. The hæmoglobin, before 30, after 100.

3. Sarcoma: One case, died. The hæmoglobin, before 19, after 90.

4. Von Jaksche's anæmia: One case, died. The hæmoglobin, before 45, after 55.

5. Leukemia: Five cases, all died. The hæmoglobin, before 22, after 81.

6. Decomposition or marasmus: Two cases, both recovered. The hæmoglobin, before 68, after 100.

7. Hæmophilia: One case, bleeding stopped, much improved. The hæmoglobin, before 20, after 98.

The last twelve of our series have been performed with the syringe method and the first sixteen with alboline-coated glass cannulæ.

The following more detailed description illustrates the usual course of events:

Case 1. Age one and a half days; admitted for intestinal hæmorrhage, since twelve hours after birth. The family physician stated that the "infant must have lost six ounces of blood." Within three hours after admission the infant passed three large bloody motions. Transfused three hours after admission, 90 c.c. of father's blood being injected. The red blood cells were 2,400,000 before transfusion, 4,700,000 directly after transfusion, and 6,400,000 fourteen hours later, showing the stimulating effect of the injected blood. Discharged the following day. Two months later the red blood cells were 4,800,000. Following transfusion the child passed two bloody stools, while three hours after transfusion another stool was passed showing no macroscopic blood.

Case 2. *Pyloric Stenosis.* Operated on August 20th, age five weeks; weight six to six and a half pounds. For the following four days after operation the infant responded poorly and appeared desperately ill. On the fourth day 120 c.c. of the father's blood was injected; the immediate result was striking and the continued upward progress of the patient till the present day seemed conclusive evidence that the transfusion was of material aid in tiding this infant over a critical period.

Conclusion

1. Transfusion is a safe and not complicated procedure.

2. The danger from hæmolysis is overrated and the injection of small air bubbles in our experience has created no ill effects.

3. In all cases the immediate effect is beneficial. The ultimate outcome depends on the original condition.

4. The best results in our experience have been obtained in hæmorrhagic disease of the newborn, simple secondary anæmia, and marasmus.

NOTES ON SOME DISLOCATIONS

By G. P. Girdwood, M.D., M.R.C.S.E.

IN May of 1854 I passed my examination in the College of Surgeons in London, and was staying with my father, who was in practice in London, when one Sunday evening about half past ten a patient was admitted having dislocated the distal phalanx of his right thumb. I tried to reduce it by pulling, and found that it was no easy matter. Thinking the matter over, I hyper-extended the dislocated phalanx on to the back of the proximal phalanx; that lifted the palmar edge up to the distal phalanx, so as to raise it just over the head of the proximal phalanx, then pushing forward the base of the distal phalanx, and there was no difficulty in reducing the dislocation.

Strangely enough, on the following Sunday evening the same gentleman again appeared with the same dislocation in his left thumb, which was reduced without any difficulty in the same way.

This same plan of reduction may be applied to any dislocations of the fingers or toes, and the reduction will be readily accomplished. It has been recommended where there is a difficulty in reducing these dislocations, to divide the lateral ligaments, but this is not considered a necessary operation. By adopting the foregoing method I think that all these dislocations may be readily reduced.

In reference to those dislocations of the thumb, upon my inquiring of the patient as to how the dislocations occurred he could only say that he was turning over in bed when they happened.

On one occasion when at Sorel one evening a fire broke out on board a boat in the harbour, I went down to see the fire, which was caused by an explosion. At the time of the fire one man on board was injured, and I was asked to see the man. Upon examination I found that the tibia had been dislocated on to the front surface of the femur. On inquiry it was found that he was standing on the deck, his weight being on the right leg, with the left one slightly flexed; the explosion took place forcing the deck up about an inch, thus dislocating the tibia on to the front of the femur; this was reduced by hyper-extension, and pushing the head of the tibia back into its place, in a similiar manner to that of the dislocation of the phalanges above mentioned.

There was no difficulty in reducing the dislocations of both these members. It is probable in this case that both the crucial ligaments were ruptured. It was learned afterwards that the man recovered the use of his joint.

In September, 1854, I was acting as locum tenens to the senior house surgeon of the Royal Infirmary, Liverpool, when a patient, who was a sailor, was admitted suffering from dislocation of the left shoulder and fracture of the left thigh, which had occurred on board ship five months before at Valparaiso. He also had scurvy, as he had spent five months in coming to Liverpool.

The dislocation of the shoulder was reduced by raising the arm straight up so that the acromion acted as a fulcrum to bring the head of the humerus over the glenoid cavity, then rotating the forearm towards the back of the head, thus bringing the head of the humerus into its proper place, and then bringing it gently down to the side of the body with the closed fist in the axilla.

This same method of reducing all dislocations of the humerus was then established by me for the first time, and in five cases that have occurred during my practice there has been no difficulty in making the reduction. This method of reducting the two dislocations of the phalanges and humerus may have been practised by others, but have not come under my cognizance, and therefore, these notes are put forward for the benefit of others who may happen not to have come across them in their readings elsewhere.

It is now fifty-six years since the Nova Scotia Hospital for the Insane was opened. During that time, 5,916 patients have been admitted, 2,626 males of whom 525 were readmitted, and 2,263 females, 500 of whom were readmitted. Of the male patients 1,308 recovered, of the female, 1,216; 982 patients improved, 545 showed no improvement, and 1,370 died; 4 were not insane. During the year 1914 the admissions numbered 211, the discharges 164, and the deaths 55. At the end of the year there were 501 patients in residence. The applications for admission were 236. The ages of those admitted ranged from fifteen to ninety years.

Case Reports

THE CURATIVE VALUE OF TETANUS ANTITOXIN

WITH CASE REPORTS

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THIS communication deals with the value of tetanus antitoxin as a means of treatment in well developed cases of tetanus, when properly administered; and when given in sufficiently large doses.

It has long been maintained that tetanus antitoxin given as a prophylactic agent has a wide field of usefulness, but little evidence until recently has been available to prove that it possesses marked curative properties. Within the past year work on tetanus has been reported which has been distinctly more encouraging. Ashhurst and John,[1] Irons,[2] and Park and Nicoll,[3] have all contributed to this subject within the past few months. According to Park and Nicoll, the significance of the method of administration of tetanus antitoxin has been pointed at different times since 1903. Neugebauer[4] in 1905 seems to have been the first to report a considerable series of cases in which the antitoxin was given intra spinally. Within the past year Ashhurst and John have shown that if simultaneous injections of antitoxin were given intravenously, intraspinally and into the tissues locally, about the focus of infection, very gratifying results might be obtained. Permin[5] has emphasized the value of tetanus antitoxin in preventing the development of tetanus in experimental animals, when they were given intramuscular and intraspinal injections.

The most interesting of the recent work on the subject, however, is that of Park and Nicoll, of the Research Laboratories of the Department of Health, of New York. They first investigated, in guinea-pigs, the relative value of tetanus antitoxin administered subcutaneously, intraspinally and intravenously. Their experimental results seem to prove conclusively that the intraspinal method of injection is the most valuable, being quite superior to the intravenous. It is also shown in several experiments that animals given only subcutaneous injections did not survive longer than the control animals, receiving no antitoxin whatever. Park and Nicoll also report six cases of tetanus, successfully treated by antitoxin, given intraspinally and intravenously.

This is the more remarkable when it is recalled that the usual mortality in fully developed tetanus is about 78·7 per cent. in cases receiving serum in the ordinary way (Permin). The importance of early treatment is very great; in three of the cases reported by Park in which the period of incubation was definitely determined, the time was nine days in two cases and ten days in one. In all of these, vigorous treatment was immediately undertaken. We are able at the present time to report two cases in which exceedingly satisfactory results have been obtained. One of the cases was under the care of Dr. J. R. Serson, in Grace Hospital, Toronto, to whom we are indebted for access to the clinical history. The other case was under the care of one of us (G. W. R.) in the Toronto General Hospital. The histories of these cases with details of antitoxin treatment are as follows:—

Case 1. R. C., aged eight, admitted to Grace Hospital under the care of Dr. J. R. Serson, on August 13th, 1914. There are no points of importance in the family, or personal history until the onset of the present illness. On August 2nd, patient, while playing with an old cutting-box in the barn, had the second finger of his left hand so badly crushed that amputation at the second phalangeal joint was necessary. This was done the same day. Two days later the finger became very painful, and sutures were removed. Moist dressings were applied and these were changed daily. On August 12th, patient complained, while the dressing was being changed, of pain in the opposite shoulder, and stated that the pain in the shoulder had been so severe the night before that he had not been able to sleep. He also complained, for the first time, of stiffness in the jaws and neck. Patient was seen for the first time on this date by Dr. Serson who made a tentative diagnosis of tetanus. Next morning this diagnosis was confirmed and patient was sent into the hospital.

On admission, the back was stiff and rigid, the jaws could only be opened about half an inch, the eyes were wide open and staring, the forehead muscles constantly contracted. When the dressing was removed from the finger, the end of which had been amputated, a violent spasm was set up which lasted for about half an hour. In this spasm, there was marked opisthotonus, the jaws tightly closed, and the whole body became tense.

August 13th: patient entered hospital, and after four spasms in the afternoon was given two injections of tetanus antitoxin, 3,000 units intraspinally and 6,000 intravenously. August 14th: after intermittent sleeping and short spasms, 9,000 units of tetanus antitoxin was given intravenously. During the night patient was given morphine, and slept irregularly. August 15th: spasms shorter, and less frequent, and at midnight 9000 units of antitoxin was administered intravenously. August 16th: patient noisy and unable to sleep; at times delirious during the night. Spasms more frequent, but very short. August 17th: patient rested better and had few spasms. August 18th: grew more restless, and complained of irritation over the body; this was followed by a rash, which disappeared the next day, however. Very few spasms during, the day, but restless at night again. August 19th: patient much improved and able to open jaws. During the night had two spasms. August 20th: slept for long periods until rash reappeared in the early afternoon. Passed a fair night only, and had a fairly good day on the 21st. August 22nd: had no spasms, and rested quietly, though noisy during the night. August 24th: two comfortable days, patient sleeping nearly all the time, with no recurrence of spasms. August 27th: patient feeling better every day, sleeping well, and enjoying full diet. This condition continued until patient was discharged on August 29th.

Case 2. C. F., on August 6th, patient stepped on a rusty hook in a lane. The wound was dressed at home with bichloride 1 to 2000. The boy played around as usual, except for a sore foot, for thirteen days, and first complaining of tightness of the abdominal muscles, but only lasting a few minutes. The following day (fourteen days) patient first complained of stiffness in jaw muscles. A physician, Dr. Prentice, was called the following evening and had him sent into the hospital. When seen by the physician the jaws could be separated about one-half inch and the patient had had several spasms of the abdominal muscles.

Patient entered Toronto General Hospital 9.40 a.m., August 30th, 1914, male child, aged twelve years, well developed, inguinal glands palpable on left side, also saphenous glands slightly enlarged, jaw muscles stiff, and can separate jaws one-half inch at 10.30 a.m., August 30th. Ulcer on left heel over tendon of Achilles, about the size of a twenty-five cent piece. Pupils dilated but react to light and accommodation. Digestive, cardio-vascular, respiratory, and genito-urinary systems, normal. Nervous system: patient sleeps well; complains of headache most of the time. Abdominal reflexes present, patellar active; knee cannot be straightened, when the thigh is flexed on the abdomen, beyond sixty degrees. Other reflexes apparently normal.

Progress, notes and treatment:

August 30th: patient taken to emergency, wound curetted under anæsthetic and bichloride dressing applied at 11.30 a.m. At 12 a.m., 3,000 units tetanus antitoxin intravenously. 1.45 p.m., spasm, tonic, of muscles of chest and upper abdomen lasting about two minutes, causing child to cry out. The muscles are rigid during the spasm. 2 p.m., chloretone grs. x; complains of severe headache. 5.30 p.m., 3,000 units of tetanus antitoxin intravenously. 6.50 p.m., spasms of thoracic muscles, tonic, lasting one minute. 9.40 p.m., 6,000 units and Mist. Bromid et Chloral, one drachm. 10.15 p.m., spasm of abdominal muscles lasting about two minutes, great desire to micturate. Child cries out. Tonic spasm, muscles firm and rigid. 10.30 p.m., spasm of abdominal muscles, one minute duration; patient thought muscles of jaws were less rigid, the jaws can open five-eight inches at this time. 11.30 p.m., spinal puncture done, fluid clear, not under pressure; 15 c.c. removed, antitoxin 3,000 units given intraspinally, and 3,000 intravenously.

August 31st: 12 p.m., morphine grs. $\frac{1}{12}$ given. 2.30 a.m., bowel movements slight: patient sleeping. 5.30 a.m., spasm followed by unconsciousness. Lies very rigid; knees drawn up, arms flexed and rigid, neck muscles rigid; perspiring freely. 11.30 a.m., 6,000 units of serum intravenously. 12.15 a.m., spasms severe, marked arching of body. 12.30 a.m., involuntary passage of urine. 2.45 p.m., conscious for a few minutes, relaxes quickly into a stupor; urination involuntary. 4.30 p.m., 6,000 units intravenously; patient can be roused but drops quickly into deep sleep; pulse irregular. 8 p.m., 6,000 units intravenously; patient very drowsy. 11.30 p.m., 6,000 units intravenously, patient very drowsy.

September 1st: 2.30 a.m., patient drowsy, pulse irregular. 1.15 p.m., patient fully conscious, pulse improved, drowsy but brighter. 3.30 p.m., wound curetted, gas used for anæsthetic, dressing changed twice daily. Bichloride 1 to 5,000 and peroxide applied. 11 p.m., 1,500 units subcutaneously; patient sleeping considerably, but easily aroused.

September 2nd: 1.15 p.m., 3,000 antitoxin units intravenously. 4 p.m., 4,500 units serum intravenously, but some lost due to plugging of needles.

September 3rd: patient improved, fully awake; jaw muscles freer; no suggestion of spasms.

September 7th: blood taken for culture in bouillon.

September 12th: jaw measured separated one and an eighth inches—still restricted.

September 13th: patient went home in ambulance, feeling fine; appetite good; no nervous symptoms.

The total quantity of serum given was 52,500 units of tetanus antitoxin.

References:—

1. Ashhurst and John, quoted by Irons.
2. Irons, *Journ. A. M. A.*, June 27th, 1914, p. 2,025.
3. Park and Nicoll, *Journ. A. M. A.*, July 18th, 1914, p. 235.
4. Neugebauer, *Wien. Klin. Wchnsch.*, 1905, xviii, p. 450.
5. Permin, *Mitt. a. d. Grenz. d. Med. u. Chir.*, 1913, xxvii, 1.

Some time ago the hospitals of Calgary were placed under the management of Mr. D. A. McKillop. This arrangement, although somewhat unusual, has been fairly satisfactory and no criticism is made of Mr. McKillop's administration. However, the adequate performance of the duties of a medical superintendent of a hospital involves special knowledge which an untrained man obviously does not possess and it is considered that the time has now come when the hospitals of Calgary should be under the direction of a man who is conversant with the medical as well as with the business side of hospital work. In view of this, a meeting of the hospital board was held on January 21st last, and a committee was appointed to consider the matter. At a subsequent meeting it was recommended that a medical man with business qualifications should be made superintendent of the city hospitals. Until this appointment is made Mr. McKillop will continue to direct the management of the hospitals.

Editorial

PROPOSED POSTPONEMENT OF THE ANNUAL MEETING

AS we go to press, word comes from Vancouver that the Committee of Arrangements recommends to the Executive Council of the Association that the Forty-eighth Annual Meeting, which was to be held in that city in July next, be postponed until after the War. The reasons which have impelled the local committee to take this action will be obvious to all. Suffice it to say that a most complete canvass of the profession has shown conclusively that no representative gathering of Canadian physicians could be got together this summer. Under these circumstances it is safe to assume that the Association as a whole will approve of postponing the meeting, and that the Executive will formally adopt the recommendation of the Committee of Arrangements. Definite announcement of the Executive's decision will be made in our next issue, to which also any fuller comment must be deferred. A word must, however, be added here in appreciation of the heroic efforts of the Vancouver committee. It is to be hoped that these efforts, which have been persisted in in spite of constant discouragement, will not be wasted, but that the Association may still meet in Vancouver at no very distant date and under the more favourable auspices of Victory and Peace.

CIVIL PRACTICE AND MILITARY NEEDS

WITH the exception of the permanent forces, whose business it is to fight, there is no body of men in the community upon whom, as a class, the present emergency makes greater demands than on the medical profession. Throughout the Empire these demands have been met fully and generously, and everywhere more physicians are preparing themselves for service as soon as they may be needed. Of those whom circumstances would allow to take their useful part in the great struggle, none would prefer to stay at home. Therefore, while honouring the volunteer, let us remember that at least equal credit is due to him who remains at his post, performing faithfully, in addition to his own burdens, the daily duties of an absent colleague. It is estimated that about one sixth of the civil practitioners in Great Britain are already serving with the Army, and if the military demands continue, as seems probable, it is not hard to foresee that the needs of the civil population may seriously suffer. In fact, the shortage made itself felt to such an extent in Scotland that several months ago a Scottish Medical Service Emergency Committee was formed, to which all questions arising out of the situation could be referred, and to supply helpers and locum tenens, where needed. The British Medical Association has now taken the matter up, recommending that committees be formed locally by its various branches, and that the report of the Scottish Committee be taken as a model. In many instances practitioners have found it physically or financially impossible to carry out the obligations they assumed towards their absent colleagues. With a view to equitable financial adjustment, the Scottish Committee recommended that three classes of practice should be distinguished: (1) Large towns, where the question of mileage is not a very important consideration, and where an equal division of the remuneration should be agreed upon; (2) Towns with a considerable population, but with a large amount of country work. It was suggested that as a general rule the division of all remuneration upon the basis of three eighths to the absentee and five eighths to the man doing all the work and paying all the expenses was the nearest to equity; (3) Small centres, or single practice areas, where travelling expenses and consumption of time were still more important.

In such, possibly, a fractionally larger proportion should be allotted to the man who is doing the work.

In the Army economy of effort is assured by thorough organization, while the civil practice of medicine is normally left to individual initiative. It is largely every man for himself. But in a crisis like the present altruism becomes a necessity, and is one of the few mitigations of the barbarous tragedy of war. In this country, in spite of the absence of so many, the dearth of medical men has not yet made itself acutely apparent. It may, however, be a serious question with us before long, and it is one which may well occupy the attention of our medical societies. In sparsely settled districts the chronic deficiency of medical facilities has been aggravated; and in the cities, where large numbers of students and teachers, as well as practitioners, are being drafted to the military hospitals, the schools are faced with a serious problem. The usual quota of graduates will not be available this summer to take up practice or hospital positions. British hospitals are applying, even by cable, here and in the United States for house officers. The General Medical Council appealed to senior medical students to wait until graduation before volunteering or, if already on service, to return and complete their course. Last October one thousand fewer students were registered in the medical schools of Great Britain than the previous year, and the President of the Council has estimated that for some years hence the number of graduates will fall twenty-five per cent. below the annual requirement.

"The physician is worth many other men" is Homer's comment on the army surgeon of his time. The world, always excepting Germany, finds little of the ancient glamour of war in the modern trench. There is more real glory in conservation than in destruction, and that glory is ours. But while our first duty is to the army overseas, there is here at home the endless warfare against disease to be waged as usual, and by depleted forces.

CLEAN MILK

WE desire to call special attention to some of the facts brought out in the report of the Milk Commission published in this number, and to the improvement which has resulted in the quality of the milk now offered to the public in Toronto.

When the work was first undertaken, sixty-seven per cent. of the milk coming into Toronto was either watered or skimmed; now all must reach the fixed standard as to purity and amount of cream and total solids or be returned to the producer, so coloured as to render it unsaleable. Great care is also demanded to be taken to ensure effective sterilization of the cans and bottles in which the milk is supplied.

The report, unfortunately, does not give us any statistics as to the actual bacterial count of the milk itself when delivered to the consumer in Toronto, although we fully grant that the by-laws of the city, if faithfully carried out, should ensure a milk of moderately low bacterial contamination. We congratulate Toronto that it has such an excellent by-law upon its statute book. We fear that as much cannot be affirmed of other Canadian cities. On this subject, however, we intend to make inquiry, and present the facts before our readers in an early issue.

There is no more important department of preventive medicine, or one in which physicians can do more effective work, than in securing for the community a clean and wholesome supply of pure milk. In no article of our food is the danger of contamination so great, and the results of contamination so disastrous. During the five years following the enactment of the milk regulations of the Board of Health of the city of New York, there was an actual annual saving of forty-one thousand infant lives each year, or over two hundred thousand in the five years. How much sickness and suffering was thus prevented, can only be estimated by physicians who know that one death under such circumstances implies sickness and prolonged poor health to many other families, and, moreover, too often implies an infection by both bovine and human tubercle bacilli, which during childhood may remain latent only to assume activity in after life.

Unfortunately the public generally are unaware of the dangers lurking in an impure milk, and are unwilling to pay the price reasonably demanded for the extra labour and expense incurred in providing a clean milk.

In the report upon the milk supply of Montreal made by professors in the Macdonald College at St. Anne the writers say that too much emphasis cannot be laid upon the fact that the farmer is given no extra remuneration for the care he may exercise to produce pure milk. Although practically all farm produce is paid for according to its quality, we find that milk is an exception. Wheat and other grains, fruit and vegetables, are all graded; the manufactured products of the farm, meat, butter, and cheese, are also graded and extra prices are demanded for the better qualities, but not so with milk. The farmer who expends time, trouble and money in securing a sanitary milk, can at the present obtain no extra price for his purer article. Compared with other foodstuffs, the rise in the price of milk has been slow, although there are many circumstances which have added greatly to the cost of its production. The Animal Husbandry Department of Macdonald College, after a careful analysis of the cost of milk production, has concluded that the price at the farm of twenty cents a gallon for milk will only pay when the milk production per cow is eight thousand pounds per annum. The average cow in Quebec yields only four or five thousand pounds. Hence one of the most important conditions for the improvement of our milk supply is an efficient grading of the milk sold in every town and city, with price apportioned to the grade. Milk too poor in quality, or so contaminated by filth and pathogenic germs as to be unfit for human consumption, should be confiscated in such a way as to prevent its use in human food. All this involves education of the public who use the milk, as well as of the farmer who supplies it, and such education must be pressed forward by the enactment in every community of stringent regulations controlling the sale and distribution of milk in its midst.

THE Order of the Hospital of St. John of Jerusalem in England has offered to provide, equip, and maintain for a period not less than six months, a general hospital of five hundred and twenty-five beds for service at home or abroad. The offer has been accepted by the Army Council and the hospital will be called "The St. John Ambulance Brigade Hospital."

THE Medical Graduates' College and Polyclinic, London, has been closed. It will be remembered that the College was founded some years ago by Mr. Jonathan Hutchinson. Unfortunately, the institution has suffered throughout its career from a lack of funds and the adverse influence of the war upon its financial standing made it necessary to close the institution.

IN Bulletin No. 277 of the laboratory of the Inland Revenue Department, Mr. McGill, the chief analyst, gives the result of an examination of seventy-two samples of tincture of iodine, which were purchased in September and October last. Sixty-two of these samples were found to be genuine, eight were considered to have been adulterated—that is methyl alcohol was used in their preparation instead of ethyl alcohol, and two did not conform to the formula of the British pharmacopœia, although they evidently had been prepared with honest intention.

In Bulletin No. 278, Mr. McGill treats of eighty-six samples of various kinds of foods for infants and invalids. He says: "They fall into three groups, essentially characterized by predominance of fat, protein, or starch, and all of them are of value under certain conditions."

An inquest was held by Mr. C. Luxmoore Drew, coroner for the western district of London, on December 19th, on the body of a French-polisher employed at an aëroplane factory at Hendon, Middlesex. Dr. W. H. Willcox, official analyst to the Home Office, stated that "the cause of death was heart failure, consequent on degeneration of the liver caused by tetrachlor-ethane present in the cellulose varnish, to the vapour of which the deceased was exposed during life." Experiments made on white rats left no doubt as to the poisonous ingredient of the varnish used. Other employees in the factory had been affected by the vapour and at the time some of them were very dangerously ill. A full account of the case is given on page 1105 of the December 26th issue of the *British Medical Journal.*

Among the cases of continued fever at the front, paratyphoid infection has been comparatively frequent. In fact, at some of the military hospitals as many as half the cases of "enteric," and particularly those cases occurring in inoculated men, have been found to be due to the paratyphoid bacillus. It is well known that the ordinary antityphoid inoculation confers no immunity against paratyphoid. The suggestion has therefore been put forward, and it deserves careful consideration, that inoculation with mixed vaccines should be substituted. As long ago as 1909 such a method was introduced by Kabeshima in the Japanese navy. He uses a vaccine consisting of equal numbers of B. typhosus and of the two important varieties of B. paratyphosus; and the results which he has obtained show conclusively that the method assures a high degree of protection against all three varieties of infection. Another point which is raised by the occurrence of paratyphoid cases amongst the troops, is the importance of carrying out a thorough bacteriological diagnosis in every suspected case. Otherwise it is conceivable that antityphoid inoculation might be brought into entirely undeserved disrepute.

Effervescent citrate of magnesia is the subject of Bulletin No. 297 of the laboratory of the Inland Revenue Department. The article is described as a pleasant cooling drink, with slightly aperient qualities, harmless, wholesome, and desirable as a summer drink, but the name is misleading. Of fifty-two samples examined not one was found to contain citrate of magnesia. The only salt of magnesia present was the sulphate, Epsom salt, and the only citrate was the sodium salt. Tartrate of soda was usually present and the amount of sugar varied from 25 per cent. to 50 per cent. The original effervescent citrate has been modified in the production of an article which would meet the taste of the public and at the same time retain the refrigerant and aperient properties of the prototype, and, as no convenient substitute has yet been found, the original name has been retained. The name "Granular effervescing salts" has been suggested, or a descriptive term such as "Effervescent citro-tartrate of soda with Epsom salt and sugar" might be used. In any case the time has come when another name should be found.

A hospital of one hundred beds has been established at Compeigne by the French government. It will be under the supervision of Dr. Alexis Carrel, and will be equipped by the Rockefeller Institute for Medical Research with complete apparatus for the study of new forms of infection incident to trench warfare. Dr. Carrel will be assisted by a staff of bacteriologists, chemists, and technicians, and the regular work of the hospital will be attended to by physicians and surgeons appointed by the French government. Dr. Dakin will direct the chemical part of the research work. The sum of $20,000 has been appropriated by the Rockefeller Foundation for the furtherance of medical research work under war conditions.

Certain amendments to the Public Health Act of the Province of Quebec have been under discussion for some time.

These have now been put into force. According to the new regulations, the board of health may require the employment of duly qualified practising physicians by proprietors or contractors in charge of shanties, mining camps, railroad construction camps, or others, if twenty-five or more men are employed. The list of notifiable diseases is lengthened by the addition of cerebrospinal meningitis, infantile paralysis, whooping cough, measles, chicken-pox, and purulent ophthalmia neonatorum. Should contagious disease exist in a municipality, neighbouring municipalities are authorized to require a certificate from any person coming from the infected district to state that said person is free from infection; in the case of smallpox a certificate of vaccination may be demanded. The new regulations also concern the water supply. In case of impurity or pollution, the board of health is authorized to investigate the matter and to order the municipality to make any necessary improvements. Should this order be neglected for thirty days, a penalty of $500 is incurred, and if the order is still unfulfilled at the end of another three months an additional fine not exceeding $25 a day may be levied. The board is authorized also to see that any necessary changes are made in the plant for the purification of the water supply, and should the municipality fail to carry out the order of the board within fifteen days, a competent person shall be placed in charge of the plant and the work shall be executed at the cost of the municipality.

In our March issue it was stated that "the French Canadian Clearing Hospital for overseas service will be organized under the asupices of Laval University." This statement calls for correction. The Dean of the Medical Faculty of Laval writes as follows: "Although most favourable to the formation of such an hospital, Laval University has taken no initiative nor assumed any responsibility in its organization. But, the Medical Faculty of Laval will—as it has already done towards the McGill Hospital—facilitate matters for any member of the faculty or student who should desire to serve in the said clearing hospital."

The diagnosis of typhoid fever in the army has been rendered more difficult in many cases by the fact that all inoculated soldiers show a strongly positive Widal reaction. A new and ingenious method of rapid bacteriological diagnosis, particularly valuable for the detection of typhoid carriers, has been reported to the Paris Académie des Sciences by Drs. Carnot and Weill-Hallé. The following description of the procedure is taken from a communication to the *Journal of the Medical Association.* "A U-tube with a constriction in the horizontal portion is used. A layer of sterilized sand is introduced into the tube and two arms are filled with sterile bouillon. One of the arms of the tube is inoculated with the suspected stools and the tube is incubated at 37° C. Under these conditions the germs introduced with the stools develop, but the typhoid bacilli, being much more motile than the other intestinal microörganisms, traverse the layer of sand and multiply in the second arm of the U-tube in which no infected matter has been placed. The character of the bacilli is verified by the agglutination test. The method is very sensitive and allows a precise result to be obtained within a few hours."

It would be interesting to know how many physicians from the United States are working in the medical services of the allies. The number must be very considerable. It is probably true that if it were not for the American Red Cross the Serbian sick and wounded would be left with little or no skilled medical attendance. Many, including some of the best known surgeons of the United States, are working in France, and some of the larger schools are giving organized assistance. Harvard has recently sent an "expeditionary unit," consisting of thirteen of its faculty, under Professor

Cushing, to serve for three months in the American Ambulance Hospital at Neuilly, and to replace a similar unit from the Northwestern University under Dr. Crile. The almost universal sympathy shown for our cause by our colleagues across the line is all the more gratifying when one takes into consideration the dominating influence of German methods and teaching on American medicine during the past half century.

THE following additional subscriptions to the Relief Fund for Belgian Physicians and Pharmacists have been received by the treasurer: Dr. Frederick Montizambert, $25; Dr. H. C. Scadding, $25; Dr. A. D. McKelvey, $10; Manitoba Executive Committee, third remittance, $200; Dr. Douglas Storms, $20; Dr. F. C. Remond, $49; Dr. W. B. Thistle, $10; Dr. Thompson, $3.50; Dr. F. L. M. Grassett, $25; Dr. Graham Chambers, $15; Drs. King and Green, $10; Dr. Andrew Gordon, $10; Dr. A. H. Perfect, $25; Dr. J. A. Oille, $5; Dr. Frederick Winnet, $5; Dr. Yellowless, $5; Dr. W. J. Clark, $5; Dr. Hoig, $10; Dr. W. E. Ferguson, $5; Dr. T. W. G. McKay, $5; Dr. Robin Pearse, $5; Dr. James Moore, $5; Dr. McKibbon, $5; Dr. T. A. Rundle, $5; Dr. Bryans, $1; Dr. R. Young, $1; Hamilton Executive Committee, $320; Dr. R. W. Bell, $5; Dr. W. H. Lowry, $5; Dr. William McCulloch, $2; Dr. J. S. Freeborn, $10; Sudbury Executive Committee, $35; Dr. C. M. Foster, $5; Dr. A. E. Wickens, $5; Dr. H. L. Anderson, $2; Dr. A. E. Ardagh, $5; Dr. W. J. Henderson, 50 cents; Dr. A. R. Harvie, $5; Dr. J. H. Cameron, $10; Dr. W. G. Gilchrist, $5; Dr. S. Johnston, $10; Dr. W. C. George, $5; Dr. R. E. Gaby, $5; Dr. J. N. Harvie, $5; Dr. A. Taylor, $1; Dr. J. A. Hocking, $5; Dr. J. E. Elliott, $5; Dr. James Moore, $10; Dr. J. H. Peters, $5; Dr. John Livingstone, $2; Dr. H. A. Griffin, $5; Dr. H. D. Livingstone, $2; Dr. P. P. Park, $5; Dr. W. E. Dingman, $5; Dr. Arthur Wright, $5; Dr. A. H. Nicol, $5; Dr. Bingham, $25; Dr. John Philp, $5; Dr. Shuttleworth, $10; Dr. James Stewart, $1; Dr. George Young, $10; Dr. Oliver Mabee, $5; Dr. Warner

Jones, $5; Dr. John Malloch, $10; Dr. P. MacNaughton, $10; Dr. A. S. Moorhead, $5; Dr. J. Webster, $10, Dr. Miller, $10; Dr. C. A. McClanahan, $4; Dr. W. C. Ryckman, $5; Dr. W. M. McKenzie, $5; Dr. F. Woodhall, $10; Dr. W. M. English, $10; Miss Madeline Bell, $5; Dr. Geoffrey Boyd, $10; Dr. Hess, $5; Dr. W. L. Bond, $5; W. Stevenson, $5; Dr. J. McAlpine, $5; Professor McPhedran, $10; Dr. J. McCulloch, $5; Dr. Calder, $2; Dr. W. T. Rich, $5; Dr. Charles Smith, $2; Dr. W. H. Clarke, $5; Dr. Thomas Bradley, $2; Dr. George Boyer, $5; Dr. Robert McDonald, $2; Dr. Colin Campbell, $5; Dr. W. J. Hicks, $2; Dr. B. A. Campbell, $3; Dr. M. McDonald, $2; Dr. Alexander Taylor, $5; Dr. Leslie Aiken, $2; Dr. N. Woods, $5; Dr. P. McG. Brown, $2; Dr. R. C. Cooper, $10; Dr. C. L. Taylor, $50; Dr. T. T. McCrae, $5; Dr. J. James, $2; Dr. A. T. Emerson, $10; Dr. E. M. Copeland, instruments; Dr. W. Gunn, $10; Dr. Wm. Reid, instruments; Dr. J. W. Shaw, $5; Dr. John Dunfield, instruments; Dr. E. Weir, $5; Dr. Eccles, instruments; Charles Hair, $10; F. Mulligan, absorbent cotton; Dr. A. H. Harrington, $10; Dr. John Kidd, $2; John L. Davison, $50; Dr. J. R. McEwen, $5; Medicine Hat Medical Society, $50; Dr. Browning, $5; Dr. F. J. Burrows, $5; Mrs. and Miss Adam Webb, instruments; Dr. Adam wright, instruments, etc.; Dr. Donald Meyers, instruments; Dr. R. W. Buckle, $2; Dr. W. Marrigan, $5; Dr. H. Kolyman, $1; Dr. G. M. Aylesworth, $5; Dr. Wm. Faul, $5; Dr. Donald McKay, $5; Dr. Donald McKay, $5.

Academy of Medicine, Toronto, Special Committee on Hospital Supplies, convener, Dr. N. A. Powell, instruments.

In October last, the Société Médicale de Montreal formed a committee to assist the French and Belgian physicians, and this committee has already collected the sum of $2,600. This may be fairly added to the amount above acknowledged, so that the total subscriptions from the medical profession of Canada to date amounts to $5,974.25.

The Canadian Medical Association

SECOND REPORT OF THE MILK COMMISSION

Presented at the annual meeting at St. John, N.B., July, 1914

To the President and Executive of the Canadian Medical Association.

SIRS: We have the honour to present to you a second report. You will recall that when this Commission was appointed in 1908 its duty was to act when possible in conjunction with local boards of health throughout the Dominion in inquiring into the conditions of milk supplies and in endeavouring to secure such legislation as would enable municipalities to exercise the control requisite to securing a pure milk supply. Our last report was presented in June, 1910, and in the following October the chairman of our Commission, Dr. Hastings, was appointed medical officer of health for Toronto. Your Commission felt that in this appointment an opportunity for working out in detail the objects of the Commission in that city had presented itself. The executive, therefore, decided to hand over the work in Toronto to the Department of Health. The following is a detailed report of the method of control of the milk supply as developed by the medical officer of health.

In the first place, coöperation was secured with Mr. W. K. McNaught, C.M.G., one of Toronto's foremost public spirited citizens and a member of the local legislature, who was deeply interested in the securing of a pure and safe milk supply. We lent him all the assistance we could, while he was endeavouring to stimulate action on the part of the legislature in this respect.

After an able address in the House on the milk problem, Mr. McNaught moved that a Commission be appointed to investigate the methods whereby clean, wholesome and sanitary milk is being scientifically procured and supplied to consumers in this or any other country, and make a report thereon. The Commission was appointed forthwith, an investigation was made, and a full and comprehensive report thereof presented to the government, resulting in the framing of an Act Respecting the Production and

Sale of Milk for Human Consumption, which received its third reading in March, 1911, became law in June of the same year, and is known as the "Ontario Milk Act."

This Act is a very broad one, giving municipalities power to pass by-laws regulating the production, handling and sale of milk; the granting of licenses; fixing standards of butter fat and total solids; dealing with preservatives, and the appointing of municipal inspectors with broad powers to inspect and rights to enter and take samples either at the farm, in transit, or from the vendors; the publication of tests; milk utensils not to be used for any other purpose; empowering municipalities to establish milk depots and operate the same; a full definition of the words "certified" and "pasteurized"—prohibiting the use of the terms unless they comply with the definition as contained in the Act.

Immediately following the passing of this Bill, a by-law was passed governing the production, handling and sale of milk in the city of Toronto. This by-law was so compiled as to embrace all details necessary for the absolute control of the milk and placed the responsibility as far as possible on the vendor, thereby eliminating the difficulties of litigation when the producer might be fifty or sixty miles away. When the by-law was before the council for its third reading, it was learned that a large deputation of producers and vendors was coming to the council to oppose the Bill. Through a member of the Board of Health, however, they were persuaded to wait on the medical officer of health first, who went over the by-law clause by clause with the deputation, and asked them if they considered there was one clause in the by-law that meant anything more than decent cleanliness in the handling of milk, such as we would all demand in the handling of any other food product. It was gratifying, therefore, that after a discussion of an hour and a half of the various phases of the by-law, they unanimously expressed the opinion that there was nothing unjust, and left the hall without waiting on the council. The by-law passed its third reading, and has been in force since.

It must be apparent that if a municipality is to have clean, wholesome milk, they must be prepared to bear the cost of efficient inspection. In order then to obtain the necessary amount of money from a municipality to control its milk supply efficiently, we must be in a position to demonstrate that the expenditure is warranted, and in order to do this, there are at least three facts that we have to establish: (1) that pure milk is the most valuable single article of diet we possess; (2) that the milk supply of any municipality that has no organized system of control is operated under conditions of filth that would not be tolerated in the production of any other article of diet; (3) that milk is responsible for more sickness and death than probably all other articles of food combined.

Recognizing the impossible task of educating the producer how to sterilize his milk utensils, and the impracticability of requiring him to have proper facilities for doing so, Toronto has placed this responsibility on the vendor who owns all the milk cans, and he is required to have duplicate sets for all producers. All vendors are required to have efficient sterilizing plants for the sterilizing of the aforesaid utensils. After the cans are sterilized, they are sealed and returned to the producer. This seal must not be broken until the producer is ready to strain his milk into the can, after which he then seals it with his own seal, bearing his name or some number by which he may be identified, which seal must only be broken by the vendor after he receives the milk.

Dr. Hastings became medical officer of health for Toronto, in October, 1910, and the Milk Bill came into force in June, 1911. Up to that date nothing had been done towards solving the milk problem in Toronto. Milk had to run the gauntlet of the producer, wholesaler, and retailer before it reached the consumer. Bulk milk was handled in many grocery stores and shops throughout the city, and despite the fact that skimming and adulteration with water were wide spread and that no sanitary precautions were taken, no action was taken, although poor people who fed the baby on this dirty, blue, watery fluid, wondered why he gained so little in weight or sickened and died.

During June, 1911, there were one hundred and nine analyses of milk made in the laboratories for butter fat, and seventeen milk samples were examined for bacteria. 67 per cent. of the milk samples tested below the legal standard, which was then 3 per cent. of butter fat, and 18 per cent. were below 2 per cent. of butter fat. This means that 67 per cent. of the milk coming to Toronto was watered or skimmed.

In August, 1911, five hundred and thirteen samples of milk were tested for butter fat, of which three hundred and twenty or 60 per cent. were above the legal standard of 3 per cent.

The mere inauguration of the milk campaign and the regular sampling of the milk caused very considerable improvement, and in June 33 per cent. of the samples were above 3 per cent. of butter fat, whereas in August 60 per cent. were above the standard.

In addition to the work done in improving the butter fat content, empty cans were tested bacteriologically as they were returned to the producer. This was done by pouring a small amount of sterile water into the can, agitating it thoroughly, and then pouring it back into a sterilized bottle, and returning it to the laboratory for examination. The bacteriological count of this can rinsing ranged from 600,000 to 36,000,000 per c.c. At the present time the dairyman receives written notice if the bacteriological count in his empty cans thus tested exceeds 5,000 per c.c. Within the last few months a dairyman was fined in the police court because his can showed a count of 100,000 per c.c. when tested on the road back to the producer. The high counts found in the cans at the beginning of the campaign were rather to be expected, in as much as there were very few dairies in the city which possessed facilities for the efficient sterilizing of their utensils. At the present time every dairy in Toronto has a boiler and sterilizing apparatus for bottles and cans, and it is seen that these appliances are properly and efficiently used.

In August, 1911, four hundred and forty-six quarts of milk were dumped for formaldehyde. This dangerous perservative has not survived the milk campaign, only one offence having occurred subsequently, and in this latter case the dairyman was heavily fined and well advertised in the public press.

As was to be expected, the first regular bacteriological examination for the milk supply indicated a serious state of affairs, and yet in this some began to show improvement.

The basis of a municipal milk control must be education, legislation and organization. Every link in the chain from the producer to the consumer must be tempered with legislation in order that there may be no weak links, and state provincial legislation must be secured in which the municipality is given broad powers of authority to pass by-laws sufficiently comprehensive to cover all local conditions.

The organization of a division of milk inspection in any municipality is extremely important. In our judgement it is imperative that veterinarians who have had a course in milk and dairy products should have charge of the inspection of the dairy farms and herds. The opinion and advice of the skilled veterinarian will rarely be resented, and will usually be appreciated and valued by the farmer. Few men appreciate getting something for nothing more than the farmer. It is not usually difficult for a veterinarian to convince a farmer that a herd kept in a well ventilated stable with sanitary surroundings, and well groomed, will yield approximately 20 per cent. more than will the average herd under unsanitary conditions in an uninspected district. Furthermore, the veterinarian can diplomatically give the farmer some advice in regard to his other stock and educate him as to the danger of tuberculosis in his herd, and the importance of segregating suspected cases.

As for the inspections of the dairies in the city, we think this can best be done by graduates from the Agricultural College, with a special laboratory training in the chemistry and bacteriology of milk. Having received their training at a model farm, with model dairies, they are accepted by the vendor as authority, and their powers for educative work are much greater in consequence.

From the bacteriological standpoint the milk was even worse. In fact, a radical change in the handling of milk from the producer to the consumer was absolutely necessary.

While the securing of a clean, safe, unadulterated supply of milk was being undertaken by the Department of Health, the coöperation of the citizens was also being sought through the *Health Bulletin* and through the public press. The consumer was instructed in the care of the milk after receiving it in his home, and was warned to keep the milk cold, and protected from all sources of contamination, and was assured that for safety all milk fed to infants should be pasteurized in the home.

The campaign with the farmer, as with the retail dairyman, has been one largely of education. This is being accomplished through the medium of the inspectors, in addition to which instructive letters have been sent from the department, warning the farmer whose milk showed the presence of an excessive number of bacteria, and assuring him that this was due to dirt in the milk or to the old milk in which the bacteria had multiplied. There has been found at all times a marked correspondence between the reports of the inspectors in regard to unsanitary conditions and the bacteriological count of the milk, the milk from filthy farms usually giving a correspondingly high bacteria count. The farmer is now learning that it pays to accept advice, and has been surprised to find that grooming, clipping and ventilation not only render his herd more healthy, but also increase the quality and quantity of the milk.

The veterinarians of the department report that when some of the stables that were too warm and not ventilated were improved, udder troubles and digestive disturbances particularly disappeared entirely. The farmer is decidedly grateful in consequence, and by tactfulness the veterinarian has developed a spirit of coöperation and friendly feeling in him for the Department of Health. He has learned that clean stables, pure air, clean food and water are as necessary to the dairy cow as to the human being. As yet the clipping of the cows' flanks and the cleaning of the udder is not as general as it should be. Some of the producers who do not follow instructions have been forbidden to ship milk into the city until they improve their premises, or learn to produce clean milk; and others have been notified and re-inspected.

At present we are endeavouring to persuade the farmer to use the small-mouthed pail; these pails have been satisfactorily tested, from a practical standpoint, and for the production of clean milk they are almost indispensable.

It is demanded that all dairy stables be kept in a sanitary condition; that the flanks of the cows be clipped in the fall so that manure cannot cling to them; that the udders be cleaned before milking; and that the hands of the milkers be clean.

The milk must be chilled immediately in a milk house separate from the dairy, and the cans must be sealed on the farm in such a way that they cannot be opened while in transit. As a matter of fact, a majority of the milk producers have built their own ice houses, and stored sufficient ice during the winter to last them for the following summer, and find that from a business point of view, it pays them to do so. Occasionally a farmer fails to stamp his initials on the seals, but they are rapidly falling in line.

After chilling, the farmer delivers his milk either at the road side for the collector to bring into the city, or it is delivered to the electric railway station, railway depot or the steam depot. If he has not had sufficient time to chill the milk satisfactorily, the bacteria rapidly multiply, and the milk arrives in the city with a very high bacterial count, notwithstanding that it may have been produced under sanitary conditions. The evening milk is delivered with the morning milk at the depot, and is received in the city the following day, so that the average milk supply to the city is thirty-six hours old when delivered to the consumer.

One of the difficulties to be contended with in the beginning of the campaign was the irresistible temptation that the carrier had to dilute the milk in transportation. It was learned on some occasions that when the collector left the last farm, he would have one or two empty cans, and several full cans, but when he arrived in the city, all the cans were full of milk and all sealed. Consequently, it was found imperative that the seals bear the initials or some mark of indentification, through which the responsibility might be placed.

In consequence of inability to control the railways in regard to refrigerating cars, and the providing of satisfactory protection at the depots for the milk when delivered, it occasionally stands for some hours exposed to the sun; and inasmuch as milk at a fairly high temperature, constitutes a very satisfactory culture medium for bacteria, the danger of this is obvious. This matter is being taken up with the railway board and in the near future there may be legislation making it compulsory for railway companies to provide satisfactory protection for the milk when delivered at the depot, and to provide refrigeration cars by which it can be kept at a low temperature until delivered to the city.

Many of the difficulties along this line could be materially overcome by the use of the collecting station such as is used by Dr. North, of New York, at Homer, in which the milk is collected from certain districts and immediately chilled, kept refrigerated, and forwarded in refrigerating cars to the city. The difficulty of the sterilization of milk utensils has been overcome fairly well by removing the responsibility for this from the producer to the vendor. All dealers or vendors in the city are required to have duplicate cans, and in fact, all milk cans in which the milk is shipped to the city are owned by the vendors. After the milk is emptied from the can, it is thoroughly cleaned and sterilized under live steam, after which it is sealed and returned to the producer.

Probably the most valuable single agent in connexion with the milk supply is the dirt tester, which should not require any explanation in this connexion. After having filtered a pint of the milk through a disc of cotton, if dirt is visible to the eye, there is little doubt that there is much soluble dirt that is not manifest and that has gained entrance to the milk. In this case, where there is indisputable evidence of barnyard contamination by the presence of gross dirt, the milk is dyed red or a strong pink color, and returned to the producer with a label attached to the can saying that it is condemned by the Department of Health as unfit for human consumption. These samples are always taken in duplicate. That is, two cans are filtered, the discs are dried; one is placed on a card which bears the name of the producer and which is kept on file, together with his score card, and when each and every test is taken the disc is attached to this card, and the date upon which it is taken, so that at any time, by referring to this, a producer can ascertain the varied conditions of his milk supply during the year. The other disc is enclosed with a letter to the producer. At first this dirty milk was dumped into the sewer as unfit for human consumption. Complaint was made, however, by the producer, that this milk should have been returned to him and that it was unnecessary waste. Faith, however, in humanity was not sufficiently strong, to warrant the department in returning it as it was. Colouring it, it became impossible for him to use it for any purpose except that of feeding to his hogs. This aroused some antagonism, but as their position was indefensible, inasmuch as they could put up no argument in favour of supplying milk that contained gross dirt, they are readily falling in line and are endeavouring to produce clean milk. Suggestions have been made that if the demands were carried out, the producers would have to ship their milk elsewhere, yet it is found that this does not hold good, and that the producer finds that shipping of the milk to Toronto pays well, and has come to the conclusion that it is not unreasonable to ask that the milk be clean.

If the milk is below the standard of butter fat or total solid, the producer and the vendor are both notified of the fact. For a second offence, if the milk falls far short of the standard, the department prosecutes forthwith. The third offence is practically always followed by prosecution, or the milk is excluded from the city. One great difficulty in securing a pure milk supply, is the fact that when people taste milk that is absolutely clean and free from barynard contamination, they have some doubts as to whether it is real milk or not, owing to the absence of the flavouring which they have been accustomed to, that is, what is known as the "cowy" taste, which is in itself an absolute evidence of unclean methods of production, and is in the vast majority of cases due to excreta from the barnyard.

To determine impurities in the milk which are not visible to the naked eye, regular samples are taken for laboratory testing. Bacteriological analysis gives the best indication of the conditions under which the milk is produced and the efficiency of the refrigeration. Samples are taken at the same time for chemical analysis, and direct bacteriological examinations of the sediment are made by the methods worked out in Boston. By this, a direct approximate count of bacteria and pus cells may be made in a few minutes by an experienced and skilled bacteriologist, and in routine examination much time may be saved by plating only those above or below a certain arbitrary standard.

One of the greatest difficulties found was in placing the responsibility for unclean or adulterated milk. There are about one thousand and eight hundred producers sending milk to the city, and this number fluctuates from year to year, and even from month to month. It was necessary, therefore, to place the responsiblity where it belonged and, if possible, upon those who could be controlled; and those would be the retail dairymen or vendors. And, therefore, the by-laws were so framed as to hold the vendor responsible for the condition under which milk was received in the city. In the first place, it is required that all milk received into the city be sealed in cans; secondly, that all milk received into the city be free from gross dirt; in fact, the vendor is held responsible for all unsatisfactory conditions of the milk as shipped to the city. This obviously works well, inasmuch as it makes it a part of his business to see that the producer from whom he receives unsatisfactory milk, is notified of the facts forthwith and warned to correct them. When the vendor is notified from the department of dirty milk or milk that has a high bacteria count, these notifications are quickly forwarded by him to the producer, with the assurance that if the condition continues, his supply will be excluded. If these conditions continue, however, the department promptly excludes the milk supply from that source from coming to the city, and it has been found in every instance that, after this notification forbidding him to send milk forward to the city with a corresponding notification to the dealer, within twenty-four hours from the receipt of the letter the producer appears in the health department asking what is necessary for him to do, and requesting that an inspector be sent out with him in order that he may comply with the requirements at the earliest possible date.

The retail dairyman or vendor, on the other hand, after receiving the milk in sealed cans, is required to handle it according to the regulations. He is required to maintain clean, sanitary premises, and to sell only bottled milk, except over the counter. All bottles must be washed and sterilized before milk is placed in them, and all cans must be sterilized and cleaned before returning to the farmer. That this efficiency is carried out and maintained is secured by a frequent inspection. The efficiency of the sterilization of both cans and bottles is tested by actual examination of the cans on their way back to the producer, and of the bottles while they are being refilled. This is done by the inspector pouring a small quantity of sterile water into the bottle, thoroughly agitating it, pouring it back into the sterile bottle, and returning it to the laboratory for examination. The same procedure is followed in regard to the cans. Any dairies refusing to sterilize cans or bottles according to the requirements of the department, are brought into court and fined, and are listed on the black book.

It has been found necessary to raise the standard of butter fat from 3 per cent. to 3·25 per cent., in view of the fact that a large portion of the milk coming to the city contained over 3 per cent. and some of it 3·5 per cent. of butter fat, and yet the retail supply was wonderfully close to the requirement of 3 per cent. We always feel skeptical of butter-making in dairies as the temptation is too great for the average man, where the standard calls for 3 per cent., and where he is getting 3·5 per cent of butter fat, for him to use his separator, and then place back sufficient cream to bring it up to the standard required. No bulk milk is permitted to be sold in the city, excepting over the counters of dairymen, or those who deal in nothing but milk.

The names of those scoring a certain standard, which is approved of by the department are published in a bulletin, and it is found that this has been very effectual in forcing many of them to more prompt action, and more prompt effort, in order to obtain the required standard for publication.

Certified milk is sold in Toronto under the seal of the Milk Commission of the Academy of Medicine. The bacteriological and chemical examinations are made in the laboratories of the Department of Health. The cost of veterinary inspection is borne by the dairy. The Milk Commission's requirements include the following:

The herd milk shall contain 12 per cent. to 13 per cent. of total solids, of which three and a half to four and a half shall be butter fat.

It must be free from colouring matter, preservatives or other foreign substances; from blood, pus or disease-producing organisms; from all disagreeable odours and tastes.

It shall not have been heated in any way, nor frozen.

All cows shall have been tuberculin-tested by the veterinarian of the Commission before entering the herd and found healthy, and shall be retested every six months.

It shall have been cooled to 45° F., bottled and sealed within one-half hour after milking, and kept at not higher than 45° F. until delivered.

It shall not be more than twenty-four hours old when delivered to the customer.

It shall not contain during July, August and September more than 10,000 bacteria per c.c. nor in the remaining months of the year more than 5,000.

The veterinary inspector and the physician of the Commission shall each month inspect the herd, the health of the employees, and the hygienic conditions of the dairy.

Two dairies supply a limited quantity of milk reaching this standard.

This standard set by the Academy of Medicine, Toronto, has been adopted in the Ontario Milk Act, and all milk sold in the province as "certified milk" must reach this standard.

Under the Milk Act, the Department of Health has large discretionary powers, inasmuch as, if in the opinion of the medical officer of health or any of his inspectors milk is not produced or handled according to the Act or any regulations made thereunder, it may be excluded from the city. It was by taking advantage of this Act that the Department of Health were enabled to frame satisfactory by-laws to control the supply.

It is not considered that the methods which have been adopted are by any means complete, and the department is open at all times to suggestions, and is endeavouring at all times to reinforce the conditions which now exist in order that it may be able more efficiently to control the supply. However, in this, as in all other health problems, education is the most potent factor. By a well organized system of inspection, persistent efforts at education, and eternal vigilance, we can hope to get clean milk, free from cow or barnyard contamination; but, as Professor Rosenau has pointed out, no amount of inspection can detect the convalescent or the mild missed case of a communicable disease, or the unrecognized chronic carrier. Nothing short of tuberculin testing of the herds at least twice a year will eliminate the danger of bovine tuberculosis, and until we have elminated the aforesaid dangers which escape inspection, and which can only be done by scientific pasteurization, we have failed in the very object of our campaign.

While endeavouring in every way to secure the cleanest milk possible, 80 per cent. of the milk sold in Toronto being now scientifically pasteurized, an ordinance is now issuing which states that, inasmuch as milk that is not up to the standard of certified milk and does not come from tuberculin-tested cows, is or may be prejudicial to public health, therefore, all milk sold or offered for sale in the city after June 1st, 1914, which does not come up to the standard of certified milk, must be scientifically pasteurized. The term "pasteurized" may be applied to milk only under the conditions laid down in the Ontario Milk Act.

No intelligent person interested in the subject of a municipal milk supply would for one moment think that pasteurization would justify the relaxing of the efforts necessary for the securing of an absolutely clean milk supply. Pasteurization is intended for one purpose and one only, and that is, to make clean milk bacteriologically clean. There are a few fossils left, however, who object to pasteurization. They die hard, but die they must, and it is imperative that they die soon in the best interest of humanity, and in the best interests of public health.

Charles J. Hastings, Chairman.
J. H. Elliott, Secretary.

The Milk Commission of the Association, in addition to the chairman and secretary, consists of the following doctors:—

A. McPhedran, W. B. Thistle, J. T. Fotheringham, Helen MacMurchy, J. A. Amyot, Wm. Oldright, R. W. Bruce Smith, George Elliott, Toronto; R. K. Kilborn, Kingston; Hugh Macallum, London; J. H. Mullin, Hamilton; W. H. Eager, T. D. Walker, St. John; A. D. Blackader, Montreal; E. S. Popham, Gordon Bell, Winnipeg; J. L. Chabot, A. T. Shillington, Ottawa; A. B. Atherton, Fredericton; S. J. Tunstall, Vancouver; H. R. Smith, Edmonton; S. R. Jenkins, Charlottetown.

The value of anti-typhoid inoculation is demonstrated by the figures issued by the Canadian Pacific Railway Company. The vaccine has been supplied to employees free of charge and in 1914, 11,772 employees were inoculated; out of this number only 4 contracted the disease, 1 of whom died. On the other hand 62 cases developed amongst those who had refused inoculation and 9 of these resulted in death. In the Alberta division 11 cases of the fever developed among 35 men who had not been vaccinated.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

DIRECTIONS FOR A PRACTICAL COURSE IN CHEMICAL PHYSIOLOGY. By W. CRAMER, PH.D., D.SC. Second edition. London, New York, Bombay and Calcutta: Longmans, Green and Co., 1915. Price $1.00 net.

DISPENSARY TREATMENT OF PULMONARY TUBERCULOSIS. By HILDA CLARK, M.B., B.S. LOND. London: Baillière, Tindall and Cox, 1915.

EXTRA PHARMACOPOEIA. By W. H. MARTINDALE and W. W. WESTCOTT. Sixteenth edition. London: H. K. Lewis, 1915. Two volumes, price, Vol. 1, 14s. net; Vol. 2, 7s. net.

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PROFESSOR WESLEY MILLS

BORN, FEBRUARY 22ND, 1847

DIED, FEBRUARY 13TH, 1915

DURING the winter of 1867-68, before beginning the study of medicine, I very often went with Dr. Bovell to his lecture on physiology at the old Medical School building in the Parks, Toronto. In those days of protoplasm and of Beale's "germinal matter," when the carmine stain had brought the nucleus into importance, he propounded for weeks the mysteries of the cell to a bewildered but delighted class, as no one could resist the personal charm and lucid tongue of a man with such a perfervid enthusiasm. Among those who caught the infection was a tall, thin student, taking Arts and Medicine, Thomas Wesley Mills. A helpful custom brought many of us into the professor's room after lecture to discuss points of difficulty: Mills was always full of them. J. E. Graham, Dick Zimmerman, Burt, of Paris, Ontario, and myself were usually of the company, and to all queries Dr. Bovell was ready with replies. Mills was deep in the philosophy course, and in many lively discussions I got my first introduction to Kant, Hegel, Cousin, and Mill. We nicknamed him "John Stuart" after the last-named philosopher. The next winter, when I became a regular medical student, the after-lecture symposia were repeated, and I got to know Mills very well, and to have a great respect for his ability in an argument. Then we parted, I to Montreal, he to teach and to save money. One lecture during the session of 1876-77, labouring at the *Proximate Principles* (taken chiefly from Dalton's "Physiology!") my eye caught on the back benches a critical expression on a familiar face—my old fellow student "John Stuart" who had come to McGill to finish his medical course. After graduation, in 1878, he took a hospital position and then went abroad to study laryngology. In the session of 1878-79 the faculty converted one of the lecture rooms into a physiological laboratory, and Dr. Arthur Ritchie acted as my demonstrator. Dr. Mills, who had worked at University College (London) laboratory, joined me in 1881 as demonstrator. We had a very active session and devoted the Saturdays to practical work, and had many class demonstrations. We used Sanderson's "Handbook," and I think we were the first in

Canada to give medical students an opportunity to work practically with apparatus. In those happy days the professor collected the fees and paid all expenses. My fees had been raised, and I took in for the session 1881-82, $2,400 and spent $1,019 on the department. The next session Dr. Mills went abroad again to study with Sir John Burdon-Sanderson, returning in October, 1883, and the faculty helped this year in the payment of his salary. When I was called to Philadelphia in 1884 he was appointed lecturer in physiology, and in 1886 made professor. In 1910 on account of ill health he resigned, since when he had been living quietly in London.

Mills had an excellent training as a physiologist. On two occasions he worked at University College with Sir John Burdon-Sanderson and Dr. Schäfer, and with Kronecker in Berlin, and twice for periods of three or four months with Professor Newall Martin at Johns Hopkins. He contributed papers on heart problems which were among the first to follow the fruitful lead of Gaskell—"On the heart of the turtle," "On the heart of the terrapin," "On the heart of the fish and menobranchus" (*Journal of Physiology*, Vols. v, vi, vii). He also became very interested in physiological chemistry and wrote a very good paper on "Oxalic acid" (*Journal of Physiology*, Vol. v). He also contributed several important articles on the physiology of the brain cortex. Subsequently two lines of study absorbed his energies. Like myself, he became a warm personal friend of Dr. Duncan McEachran, principal of the Montreal Veterinary College, in the work of which we were both keenly interested. This association led to a long series of researches on comparative physiology, and more particularly on animal intelligence. He started private kennels and studied the dog in all phases of health and disease, and he published two works, "How to keep a dog in town," and "The diseases of the dog." In 1886 appeared "Outlines of lectures on physiology," in 1889, "A text-book of animal physiology," and in 1890, "A text-book of comparative physiology." In 1898 he summarized his psychological studies in a work, "On the nature and development of animal intelligence," which, I am told, is still one of the best manuals on the subject.

One of Mills' earliest contributions to the *Journal of Physiology* was on the voice. He was passionately devoted to music, and was himself in younger days no mean performer on the violin. In 1906 he published an important work on "Voice production in singing and speaking," which brought him much reputation outside of medical circles. Since his retirement and serious illness he lived in London, and devoted himself with great energy and enthusiasm to the study of music. He had pet theories, but it is surprising how thoroughly familiar he became with all the aspects of the subject. Only a few weeks ago he wrote me a long account of his hopes and ambitions for more and better music in this country and in Canada. He was a constant contributor and critic to various musical journals. He has left to the library of the McGill Conservatory of Music his works on the subject, also his violin for the use of a poor student, and a collection of books of clippings of musical criticisms, which, as he says in his will, "cost me much labour and will probably increase in value as time passes."

Mills had all the essentials for success—ambition, brains, and a capacity for hard work; but in his make-up there was a curious lack of capacity for happiness—not in his home, but in collegiate and professional circles. Temperament, or possibly the hard struggle of his early years, had made his outlook on life a bit sombre, and he often understood his colleagues as little as some of them did him. Howard he loved, and could appreciate his stern sense of duty; but the opportunism of Craik, the philosophic calm of Ross, the contagious hilarity of Roddick, the cynical wisdom of Shepherd, and my own frivolities he never understood.

Upon men obviously striving to be taken at their own valuation the world has no mercy; now and again one wins out, but the majority form a battered band whose work and worth never receive a due mead of appreciation. It is the careless sinner who goes a-whistling and working through life, caring not for what the world thinks, who gets more than his due, and can say with Wordsworth as the shadows lengthen "the gratitude of man has oftener left me mourning." It is tragic that one who had done so much and worked so hard should be able to write, as Mills did to me, "I have not fared too well at the hands of men during my life." Like many men devoid of the quality, he prided himself on a keen sense of humour. This led to a mental astigmatization which sometimes gave a blurred vision, even in the sunshine of life. Guileless as a child, he was at the mercy of the coarser spirits of a class who took advantage of an innocency made piquant by the assurance of wisdom. But to the earnest student Mills was a devoted teacher and a constant friend. His labours in connexion with the student societies should always be carefully remembered at McGill. He worked hard for the school and for the university, and built up an excellent department in physiology.

Mills was singularly happy in his death. Following a serious operation, prostatectomy, in 1910, he was ill for months, and one of the best articles on the psychology of the sick-bed and of nurses from the standpoint of the patient is to be found in his article entitled, "Some considerations bearing on the patient, the student, and the nurse," in the *British Medical Journal*, March 19th, 1910, in which he gave his history as a patient for a year. The story illustrates Plato's shrewd remark that to appreciate fully all the aspects of a disease a doctor should have had it. An interesting feature is the personal description of the concentrated wretchedness in the condition of shock. During the past few years he had been very well. About ten days before his death he wrote complaining of attacks of pain in the pit of the stomach, which he feared were anginal, and he had had one or two attacks of dyspnœa. But a reassuring letter from me put the thing out of his mind, and he wrote saying he was quite well again. On Saturday afternoon, February 13th, after luncheon he was writing, when his wife heard his head drop on the table. He fell over, and in a few minutes was dead. A post-mortem showed advanced coronary artery disease, a fresh thrombus in one branch, beginning aneurism at the apex of the left ventricle, sclerosis of the arteries, and large arteriosclerotic kidneys.

W. O.

Obituary

THE following tribute to the late Dr. Kingston has been received from the secretary of the Elgin County Medical Association:

Dr. J. J. Kingston, one of Aylmer's most useful and respected citizens, died at Aylmer on Friday evening, March 12th, 1915. Dr. Kingston received his medical education at the Toronto School of Medicine and was a graduate of Victoria University. For a number of years he carried on a successful practice at Vienna, Ontario. About twenty-eight years ago he moved to Aylmer, where, in the seventieth year of his age, he died.

Another scene in life's drama has been enacted and the faithful actor has passed beyond the bounds of time. Those who knew him best loved him most. His modest reserve placed him in an atmosphere entirely his own and his quiet dignity secured for him the respect of those with whom he was called upon to mingle. His studied methods and his timely advice gave him an enviable rank among his fellow-practitioners, while his humor, like a sunbeam, touched their hearts and gladdened their lives. To him the young could appeal and find a father's heart. To him the more matured could go and come away impressed with the idea that in every respect he was a true man. His whole life was a fulfilment of the statement: ''Given to hospitality, apt to teach.'' While we mourn his loss the beauty of his life lingers with us and gently leads from the harsher scenes of life to the spirit land where the reigning Sovereign sits enthroned in love. While he lived he was a leader in the community and now that he has passed away the memory of his life will be an incentive to nobler deeds.

DR. S. GOWAN, of Brockville, Ontario, died of typhoid fever March 13th. Dr. Gowan, who was forty-one years of age, was born at Creemore, Ontario. He graduated from the University of Toronto in 1902 and had been practising at Brockville in partnership with Dr. H. A. Clark.

DR. GEORGE A. WILLIAMS, of Toronto, died March 2nd. He was the son of Dr. Williams of Allenford.

DR. GEORGE VEITCH, of Port Elgin, Ontario, died March 18th, at the age of fifty-five years. Dr. Veitch, who was of Scotch parentage, was born in Waterloo County. He first practised at Linwood and, about twenty years ago, removed to Port Elgin. He is survived by his widow, two sons, and one daughter.

DR. W. J. PASMORE, of Deseronto, Ontario, died at Toronto on Thursday, March 18th, in the seventy-fourth year of his age. Dr. Pasmore was educated at the Rockwood Academy. He graduated as M.B. from the University of Toronto and commenced to practise at Rockwood. From Rockwood he went to Conestego where he practised for twenty-three years; to Toronto in 1891, and to Deseronto in 1899. Dr. Pasmore was an active worker in the field of temperance and a strong advocate of temperance legislation. He was also prominent in political circles. He is survived by his widow, two daughters, and two sons.

DR. HILLIER NOEL COULTEE, of Sharbot Lake, Ontario, died in the Kingston General Hospital in the fifty-ninth year of his age.

Dr. Coultee was born in Ottawa and graduated in medicine from Queen's University.

Dr. William Britton, of Toronto, died March 11th, in the sixty-third year of his age. Dr. Britton graduated from the University of Toronto; he was a brilliant student and double gold medalist. He practised in Toronto until three years ago, when his health began to fail. Dr. Britton was appointed by the Senate to represent the Faculty of Medicine of the University of Toronto at the Council of the College of Physicians and Surgeons and during the fifteen years that he held office, he won the confidence of all concerned by his forethought and intelligence. He leaves a widow and one child.

Dr. Archibald Montgomery died at Toronto from heart failure on Tuesday, March 9th. Dr. Montgomery graduated from the University of Toronto in 1894. He had been practising in the Peace River District for several years.

Dr. A. S. Shadd, of Melfort, Saskatchewan, died at the Winnipeg General Hospital on Tuesday, March 9th, in the forty-seventh year of his age. Dr. Shadd was born at Chatham, Ontario, in 1866. He taught for a time, then took to farming, and subsequently entered the University of Toronto as a student of medicine. He did some post-graduate work at the University of Edinburgh and, in 1907, went into practice at Melfort. He leaves a widow, one son and one daughter.

Dr. Cornwall, of Omemee, Ontario, died March 12th, in the eighty-fourth year of his age. Dr. Cornwall was born at Port of Spain, Trinidad. He was reeve of Omemee for a number of years and warden of the county of Victoria.

Dr. Francis Button Marr, of Ridgetown, Ontario, died February 19th, in the seventy-fifth year of his age. Dr. Marr was born near Markham, Ontario, on April 4th, 1841. After graduating from Toronto University, he practised for a short time at Almonte, Michigan, and in 1872 removed to Ridgetown where he had a large practice. About ten years ago failing health made it necessary for him to retire. Dr. Marr leaves one son, Dr. Delaski Marr, of Ridgetown.

Dr. C. Osborne Tupper, of Brooklyn, New York, died February 23rd. Dr. Tupper was the son of Dr. Nathan Tupper, of Amherst, Nova Scotia. He graduated from Jefferson Medical College and for a time practised in Amherst. He went to Brooklyn about seventeen years ago.

Dr. David J. Minchin, of Berlin, Ontario, died February 28th, in the fifty-eighth year of his age. Dr. Minchin was born at Shakespeare. He graduated from Trinity College in 1885 and at once went into practice at Berlin.

Dr. F. W. A. Brown, of Oshkosh, Wisconsin, died February 19th. Dr. Brown was born near Lyn, Ontario, in 1862. After graduating from McGill University in 1894, he went into practice at Oshkosh.

Dr. I. W. Powell, of Victoria, British Columbia, died February 25th. Born at Port Dover, Ontario, in 1839, Dr. Powell graduated from McGill in 1862, and went into practice in Victoria. In 1865 Dr. Powell became a member of the legislative assembly. He was particularly interested in education and bent his energies towards the establishment of a system of public schools; later he became first president of the board of education. In 1867, Dr. Powell became vice-president of the Confederation League which aimed at the union of Canada under one government. Dr. Powell refused the senatorship offered him and retired from public life to devote his attention to the profession he had chosen. He leaves a widow, five sons and four daughters.

The death of Dr. W. E. Brown, of Peterborough, Ontario, occurred on March 2nd. Dr. Brown was fifty-four years of age.

Dr. G. G. Evans, of Vancouver, died March 1st. Dr. Evans had been examining an automatic pistol which went off accidentally, causing an explosion of dynamite at the Pacific Great Eastern Railway camp at Cariboo. Dr. Evans was injured and died the following day.

News

ONTARIO

For the time being a way has been found out of the difficulty in connexion with the water supply at Ottawa. Some weeks ago it was suggested that an overland pipe should be laid to Lemieux Island and the suggestion has received the approval of the provincial board of health as a temporary measure only. It is the intention, subsequently, to install the thirty-one mile lake system.

The monthly report of the Department of Public Health for February contains the following list of cases of infectious disease: diphtheria, 46; scarlet fever, 69; typhoid fever, 6; measles, 8; small-pox, 2; tuberculosis, 52; chicken-pox, 64; whooping cough, 20; mumps, 194; meningitis, 8.

It is probable that a joint official head of the Institute of Public Health and medical officer of the city of London shall be appointed, and that a medical man shall be engaged as his assistant. Until the appointment is made, Dr. Hutchison will continue his duties as medical officer of health with the assistance of Dr. W. S. Downham.

Dr. Harvey Clare has been appointed medical director of the Reception Hospital for the observation and treatment of incipient and suspected mental cases, Toronto. Dr. Clare was assistant medical superintendent of the Toronto Hospital for the Insane.

It is proposed to enlarge the Amasa Wood Hospital at St. Thomas. The rooms in use now number forty-eight and it is proposed to increase this number to sixty. During the past year 635 patients were treated in the hospital; there were forty deaths.

A temporary military hospital of one hundred beds is to be established at Kingston as the present hospital is not large enough to meet requirements and it has been necessary to send soldiers both to the General Hospital and to the Hotel Dieu.

Dr. H. M. Langs is acting as medical officer of health at Hamilton during the absence of Dr. Roberts, who will accompany the second contingent of the Canadian Expeditionary Forces.

The cost of maintaining indigent patients in the hospitals of Toronto during the year 1914 was $417,000, as compared with $240,153 in 1913. The difference is due largely to the advance in the daily charge made for each patient which has been increased from seventy cents to one dollar.

QUEBEC

There are 1,200 municipalities in the province and it is estimated that smallpox is present in 150 of them at the present time.

It is proposed to build a tuberculosis hospital in Montreal. For this purpose the sum of $150,000 has been included in the civic estimates for the current year and it is hoped that a building capable of accommodating one hundred patients will be completed within twelve months. It is possible that dispensaries will be established which will work in coöperation with the hospital.

Dr. S. Boucher, medical officer of health of Montreal, has prepared a report on the milk supply of Montreal and has asked that $500 be voted by the board of control so that the city may meet the expense involved in taking out actions against vendors of impure milk under the Federal law.

The epidemic of typhoid at Hull appears to have subsided. One hundred and fifty cases were reported between last August and February. According to the daily press, at the end of February no attempt had been made to chlorinate the water supply despite an order to that effect from the provincial board of health.

The ninety-third annual meeting of the corporation of the Montreal General Hospital took place on February 16th. A large number of the members of the staff have volunteered for active service and many have already left. The work of the past twelve months has been satisfactory; the number of patients, 5,510, was larger than ever and of these 3,074 were non-paying, 1,342 were public, 444 were semi-private, and 650 were private patients. The deaths in the institution numbered 416 or 7·6 per cent. During the year twenty-five life governors of the hospital have died. The following additions were made to the staff: physicians, Drs. A. G. Nichols, A. Armour Robertson, C. F. Wylde, Geo. A. Shanks; surgeons, Drs. Kenneth Cameron, A. R. Pennoyer, W. L. Barlow, W. H. P. Hill, C. K. P. Henry, F. J. Tees; specialists, S. H. McKee, H. M. Little, R. H. Craig, F. S. Patch, J. A. Nutter; dental surgeons, J. S. Ibbotson, T. G. Henry, D. J. Berwick, J. B. Morison; pathological department, D. D. McTaggart. After the annual meeting a special meeting was held to consider certain amendments to the by-laws. It was moved by Mr. Lansing Lewis and Lieutenant-Colonel Gardner that the Charter be amended in regard to the qualification, requirement, and manner of election of the medical and surgical staff. The motion was carried unanimously and the board of management was authorized to draw up suitable amendments to the Charter, and to submit them at the next session of the legislature of the province of Quebec. The agreement between the Montreal General and the Maternity Hospitals concerning a joint campaign for the raising of funds was extended for a further period of four years. An expression of appreciation was made of the services of Dr. W. A. Molson who has retired from the medical staff on which he has served for thirty-eight years.

MARITIME PROVINCES

THREE hundred and sixty-five patients were admitted to the Amherst Hospital during the past year, and among these were 268 surgical cases. The number of hospital days was 5,284 and the average daily cost per patient amounted to $1.74. Eleven deaths occurred.

MANITOBA

THE annual meeting of the Winnipeg General Hospital was held March 8th. Regret was expressed on the retirement of Dr. J. O. Todd and Dr. John Macdonell, both of whom have been connected for years with the staff of the hospital. Since the commencement of the war, eighteen officials have left for the front, including nine doctors and two nurses. The annual report drew attention to the large percentage of public patients treated during the past year. The total expense incurred during the year amounted to $311,357 and as the revenue only amounted to $257,277, the deficit for the year is $54,080. The average daily cost of maintenance per patient was $2.21.

ALBERTA

During January, two hundred and forty-two cases of infectious disease were reported in Edmonton and among these were one hundred and eighty-three cases of measles or German measles.

SASKATCHEWAN

Diphtheria has been very prevalent in Regina. The cases, however, were not serious.

BRITISH COLUMBIA

There is an outbreak of smallpox at Kootenay. It is reported that about three hundred cases have occurred; the disease is of a mild type, however.

Instead of paying for each indigent patient treated, the municipal council of Summerland in future will make an annual grant of $300 to the hospital.

An outbreak of measles is reported from Queensborough.

The St. Joseph's Hospital at Comox has been enlarged and now has a capacity of forty beds.

The patients treated in the Royal Inland Hospital at Kamloops during the past twelve months numbered 853. This is less than in 1913 when 1,287 were treated and is explained by the fact that certain railroad and other construction work in the neighbourhood has been discontinued. The number of deaths was 41. The average daily cost of maintenance for each patient was reduced from $1.95 in 1913 to $1.71 in 1914.

MEDICAL COLLEGES

McGill University.

Of paramount interest at the present time is the organization, in connexion with this faculty, of No. 3 General Hospital (McGill). Early in October after the opening of the session, Dean Birkett offered to the War Office, through the Department of Militia and Defence of Canada, the personnel of a general hospital on the lines of communication. This was accepted in December and the work of organization was at once proceeded with. Dean Birkett was unanimously chosen by the faculty for the post of commanding officer, the other officers to be chosen from among the members of the teaching staff of the faculty and also holding positions in the hospitals connected with the university; the other members of the faculty immediately connected with the organization and choosing of the staff were Professors Adami and Elder. The unit was to be composed as follows: 21 officers, 2 warrant officers, 43 nursing sisters, 13 non-commissioned officers and 128 rank and file, making a total staff of 207. The nurses were required to be graduates of the Montreal General or Royal Victoria Hospitals, the officers, teachers in the faculty, and the rank and file, as far as possible, the medical students of the faculty.

The following were the officers selected in addition to Lieut.-Colonel Birkett: Drs. J. M. Elder, John McCrae, J. G. Adami, H. B. Yates, W. H. P. Hill, E. W. Archibald, A. H. Pirie, L. J. Rhea, W. G. Turner, C. P. Howard, H. M. Little, W. B. Howell, C. K. Russel, Wm. Hutchinson, J. C. Meakins, W. W. Francis, J. A. McMillan, R. H. Malone, L. H. McKim; with Mr. David Law as quartermaster, and Dr. Alford Stevenson as dentist, and Dr. L. L. Reford and Mr. Revere Osler as supernumeraries.

In February the Faculty received a communication authorizing an increase in the personnel to a total of 308, the hospital itself to be increased to 1,040 beds. The following additional officers were then selected: Drs. H. C. Burgess, J. G. Browne, H. C. Dixon, W. T. Ewing, D. A. Hingston, R. St. J. MacDonald, W. Wilkins, J. L. Todd, J. C. Wickham, L. H. Thornton, dentist, and Dr. L. L. Reford and Mr. Revere Osler from supernumeraries to the regular staff.

Many graduates throughout Canada and the United States have volunteered for service with this hospital and so great an enthusiasm has been manifested by friends of the faculty that a sum of nearly $20,000 has been subscribed to date, wholly unsolicited, a motor car, several motor ambulances, a gas-anæsthesia apparatus and very many donations of supplies for the hospital have also been received.

The students of the faculty volunteered in satisfactory numbers and about 100 have been selected, many offering to go in any capacity in order to serve. These students going with the hospital will receive an oral examination in the various subjects during the first week in April, and every man is expected to complete his year before leaving. A special convocation will be held for the members of the final year so that they may receive their degrees before leaving. The unit is now up to full strength and expects to leave Montreal about the middle of April.

Queen's Universty.

The Militia Department has accepted the offer of the medical faculty of Queen's University to furnish the personnel of a stationary hospital for overseas service. The personnel of the hospital will consist of one hundred doctors and thirty-five nurses. The recruiting is in charge of Major Frederick Etherington.

Toronto University.

Lieutenant-Colonel J. A. Roberts, A.M.C., will be in command of the base hospital which is to be supplied by the University for service at the front. The officers have not yet been officially appointed, but it is probable that Dr. W. B. Hendry will be second in command. Contributions to the amount of $8,500 have already been made to the hospital, which will have 1,050 beds.

ARMY MEDICAL SERVICES

The following have been appointed regimental medical officers. Reserve Park, Captain W. G. Dalpe, A.M.C.; 24th Battalion, Victoria Rifles, Captain J. S. Jenkins; 21st Battery, C.F.A., 6th Brigade, Captain Maclean; 23rd Westmount Regiment, Major J. S. Spier; 22nd French Canadian Regiment, Captain C. Laviollette.

Major C. E. Doherty, of New Westminster, British Columbia, 104th Regiment, who went to England with the first overseas contingent, has been appointed chief administrative officer of the Canadian Medical Service.

Major J. R. M. Collie, of Pictou, Nova Scotia, is serving as medical officer of H.M.S. *Superb.*

Dr. R. A. Bowie, of Brockville, Ontario, will be attached to one of the base hospitals in France. Dr. Bowie went to England in December.

It is announced that No. 3 stationary military hospital will accompany the eighteenth battalion when it leaves for the front.

Several deaths from cerebrospinal meningitis have occurred among the troops stationed at the Exhibition Camp, Toronto.

Dr. W. Brown and Dr. R. D. Nasmith, of Moose Jaw, have received appointments in the overseas hospital service.

Captain J. J. Ower, of Montreal, is serving as bacteriologist at No. 2 Stationary Hospital, Le Touquet, France.

No. 1 Stationary Hospital, which accompanied the first contingent, has been established at Treport, near Dieppe.

The capacity of the Duchess of Connaught's Hospital is to be increased to five hundred beds. This will necessitate four additional cottages, which will cost $80,000. Major R. W. Leonard, of St. Catharines, Ontario, has subscribed $25,000 towards the amount required.

Drs. George Hall and Harold E. Ridewood, of Victoria, have left to join the staff of one of the base hospitals in France.

Some time ago a letter was received by Sir Lomer Gouin, the premier of Quebec, from the Servian Royal Legation in London asking for the names of Canadian doctors who would volunteer for service in the hospitals of Servia. The following is the list of those who have volunteered to go: Drs. Albert Paling, Winnipeg; J. M. Casserly, St. Thomas, Ont.; W. J. McAlister, Calgary; A. W. M. Leclair, Letellier, Man.; O. S. Waugh, Winnipeg; D. C. Hart, Kipling, Sask.; Arthur Macaan, Birtle, Man.; R. L. Hutton, Rosthern, Sask.; J. Hetherington, Carievale, Sask.; Thomas H. Smith, North Sydney, N. S.; James Peake, Winnipeg; W. A. Dymond, Winnipeg; Alexander Osmanly, Toronto; W. P. Mackasee, Spring Hill, N.S.; O. A. Cameron, Stratford, Ont.; F. H. Bowen, London, Ont.; D. E. Scott, London, Ont.; J. V. Brandon, Winnipeg; L. Zealand, Winnipeg; J. Baxter, Chatham, N.B.; W. B. McVey, St. John, N.B.; G. Degrys, Abenakis Springs; Alfred Whitemore, Cabri, Sask.; V. Bourgeault, Marcelin, Sask.; P. E. Lavoie, Marcelin, Sask.; C. M. Keiller, London, Ont.; G. E. Duncan, Vernon, B.C.; M. F. Lucas, Dryden, Ont.; J. Murray, Winnipeg; P. A. Guay, South Shipshaw, near Chicoutimi, Que.; E. E. Rohrabough, Sanford, Man.; B. A. Hopkins, Blaine Lake, Sask.; and J. B. Mackay, Kitscoty, Alta.

WAR NOTES—II *

BY T. A. MALLOCH, M.D.

CROIX ROUGE BELGE, DUNKERQUE, *February 14th*, 1915.

ON the last day of December I left Dunkirk and Malo-les-Bains and bade farewell to the Friends, who had been so kind to me. However, on the 30th we had quite an exciting time, considering that Dunkirk can hardly be called on the firing-line—and I must tell you something about it. In the morning on walking up from the quay we heard the rapid fire of French *mitrailleuses* behind us and looking up, saw immediately above us a German aeroplane, not a "Taube," but one of the new "Aviatiks." This was not a new sight, but imagine our excitement, when a second after it had disappeared over the tall building under which we were standing, we heard the loud explosion of a bomb almost in the next street. We walked on towards Malo, but were none too pleased, a few minutes later, to find this great bird again over us, not knowing when they might drop another deadly missile. Meanwhile more hostile aircraft had arrived on the scène and we heard several more bombs exploding in the town. The "pom-pom" of the *mitrailleuses* was incessant, but the French dared not fire shrapnel, for fear of the falling shells. Every soldier in the streets pointed his rifle and fired at the aeroplanes and the "crack-crack" of these is most startling at first. We all gathered in the open square at Malo—sensible people would have sought cover in the cellars—and it was not agreeable to hear the rifle bullets, fired away off in towns somewhere, rattling down on the tiled roofs. Later I found a bullet stuck firmly in a beer barrel on a cart standing in the street. Altogether seven aeroplanes visited us, seventeen bombs were dropped and seventeen people were killed and forty-one injured. We learned how difficult a thing it is to hit these craft, and could not but admire the courage of the aviators. As ill luck would have it, or was it the ubiquitous spy who had warned the enemy, many of the French machines had been seriously damaged in the hurricane two days before. Since that time many more German aeroplanes have visited Dunkirk, by night and by day. On one occasion they dropped eighty bombs, but the arsenal was untouched. It seems extraordinarily difficult to hit the object aimed at.

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* The first of Dr. Malloch's letters appeared under the title "Hospital Experiences in France," in the February issue, page 155.

The next day, December 31st, I came up from Dunkirk to La Panne by motor, a distance of about fourteen miles. The road runs beside the canal and, that day, was full of motor and horse transport waggons. It was quite amusing to see the large Paris motor 'buses carrying troops to and from Dunkirk. They are very useful where the roads are good, and plenty of them from London are to be seen in other parts of France. The centre of the road was firm and good, but the sides soft and muddy and as a consequence we were often held up to allow the transports to get by. However, Belgian soldiers, on rest from the trenches, have been at work repairing the road with broken bricks and now, I am told, the *route* is splendid. At first one finds the landscape of the Low Countries very picturesque, with sand dunes everywhere and an occasional windmill against the sky, but one almost feels the absence of trees—for there are only a few of these along the road-side. We passed through several earthwork barriers on the road and saw wire entanglements prepared against the expected on-rush of the Germans, weeks ago now. Furnes, just across the border and then the seat of the Belgian army headquarters, was crowded with soldiers, but we saw nothing of the results of the bombardment of the previous day. At Furnes we turned towards the sea and soon covered the few miles to La Panne.

La Panne is a small place on the coast. What we call "the village" is the older part of the town and is full of quaint little taverns, with unpronounceable names, and fish shops. The remainder consists of numerous new villas along the *digue* or perched up on the dunes, and two fair-sized hotels. This part forms the watering place which has been so popular with Belgians of late years. Now it is one of the very few comparatively safe places in the little triangle which remains of Belgium. The villas are packed with soldiers, who are stationed here or are resting for a few days away from the trenches, and in the late afternoon they crowd upon the *digue* and into the streets. The Queen, who is unwilling to leave her country for any length of time, lives in a villa at one end of the promenade and the King comes and goes from time to time.

Dr. Depage, a very well-known surgeon in Brussels, who had a hospital in the Palais there before and after the German occupation, determined to set up a hospital in La Panne directly behind the firing line, and chose one of the hotels, "Grand Hôtel de l'Océan," for his purpose. The Queen was very interested in its organization and, as usual, British money has made the undertaking possible, though I might add that Madame Depage is now visiting Canada and the States to form an American committee. Work was commenced early in December, and with remarkable rapidity the five storied narrow white building was quickly transformed into what is now one of the best equipped of any of the field war hospitals; and remember it is only a few miles from the firing line. Not a window was forgotten in putting up red crosses and no one could take the "*Ambulance Océan*" (as it is officially called) for anything but a hospital. It is right on the *digue* and only a few yards from the sea at high tide, and a queer little steam tram line runs right behind it. Central heating, quite an indispensable thing in this climate, and a good system of hot water were installed. The hospital was opened about ten days before my arrival. On the ground floor the café has become the dining room for everybody, and along the long corridor are the offices, the laboratory, *x*-ray room, dark room and two splendid operating rooms with very good electric light, washing fixtures and sterlizing room. The next four stories form the wards and the fifth floor is used as sleeping quarters for the nurses. The large *salon* on the second, which faces the sea, is now the recreation room for those patients who are able to be out of bed. There is a piano here, much out of tune, the inevitable gramaphone (the soldiers love "Tipperary") and many picture puzzles and games. Hotel rooms are not very suitable for patients, and it is a great pity that the light partitions were not knocked out. There are many single rooms but most of them hold two beds, whilst the largest have only four in them. The nursing is rendered very difficult on this account, when it is taken into consideration how ill so many of the patients are. We use a trolley or sort of dinner waggon to take the dressings and instruments from room to room. On the average, each ward has about thirty-five beds. Temporary sheds have been put up as garages. Plans have already been made for two new one-storied buildings and then we shall have four hundred and fifty, instead of about one hundred and fifty beds as at present. Indeed, some of us began to level the sand dunes in the open space beside the hotel, but the sort of thing was only as a form of exercise and the labour at present is being done by Belgian soldiers, and the amateurs merely look on. So far, the "*Ambulance*" has never been completely filled up, but we are told that, comparatively speaking, there has been very little heavy fighting going on and that spring will see much more. At present for infectious cases there is an extra villa at some distance from the hospital. We have there a convalescent typhoid, two cases of tetanus and one of gas gangrene. Nurses, of course, are on duty there. It is quite delightful the way in which the best villas in a town may be commandeered in war time for military and Red Cross purposes; but they are cold damp places at the best here. Another villa houses the drugs and medical supplies and is known as the *pharmacie,* and several others are used as quarters for the surgeons, night nurses, laundry, etc.

Dr. Depage is in command here and has complete control of everything. He has the rank of lieutenant-colonel in the medical service of the Belgian Army. He is one of the best-known surgeons in Belgium, professor of surgery in the University of Brussels, and is also surgeon to the royal family. Last spring he was president of the Surgical Congress in New York, but did not visit Montreal as so many of the European surgeons did. Professor Depage looks into every detail of the work and every morning receives a report from the matron, the housekeeper, the medical staff, etc. Considering all the difficulties, the hospital is in admirable running order, though occasional friction is inevitable. Two surgeons do the work on each floor. There are six Belgian surgeons holding commissions in the Belgian Army and three British. Of the latter, one is an Australian woman, who had a hospital in the Casino at Ostend of about two hundred beds. She remained, doing perfectly splendid work, after the arrival of the Germans and was even asked by them to go down and work in their rear lines. Now she attends to the infectious cases in the villa as well as assisting with the work on the *troisième étage.* The Belgians are a very nice set of men and I am very happy to be working with Dr. Van de Velde, a young surgeon from Ghent, on the second floor. He speaks English very well indeed, so that my poor French is not needed with him. I am very glad that he can manage Flemish, for it would be impossible for me to obtain any history at all from some of the wounded. Two other Belgian doctors do the *x*-ray work and still another is the bacteriologist and laboratory man. The *garde* for the day acts as admitting officer, and dresses any soldiers who come from the village. Our turn comes about every tenth day and we are on duty for twenty-four hours. If any cases requiring immediate operation are admitted at night the *garde* performs it, but calls out of bed the second and third *gardes* to act as his assistants. The other night thirty wounded arrived and all the staff were at work, with four tables in use.

We have between forty and fifty nurses, most of whom are fully qualified. The matron is a splendid manager and, though she does not speak French, it is wonderful to see how she manages the orderlies and stretcher-bearers, and makes known what she wishes done. There are four or five Danish nurses, one Russian, one Italian and one Swiss. In one ward the other day, including the patients, nine different nationalities were represented. In the "theatre" staff, Dr. Depage has some of his own nurses from Brussels. It is interesting to learn that in Belgium the operating room nurses do not have to follow out the full course of training. Naturally the nursing must be very heavy work, but it is very well done.

I think perhaps the hardest worked individual in the hospital is the young Belgian lady who acts as housekeeper, and orders the meals for nearly two hundred and fifty people every day. Where all the good things come from we do not know, but the meals are excellent in quality and variety. The patients probably never lived so well in their lives before. Another Belgian woman, wife of one of the surgeons, acts as head of the laundry, is at work from morning to night and has no end of trouble with the "help" and the boilers. In the villa next to the laundry another Belgian women receives all the clothes of the wounded on their arrival, sees that all are cleaned, disinfected and mended before the poor fellows are "evacuated" and sent on to Calais. One has to admire all these Belgian women, whose husbands are at the front and whose children or families are safe in England. It must be borne in mind too that probably they have never had to do a "hand's turn" before at anything of this kind. They could all so easily go over to England.

In the office a staff sees to all the clerical work and makes out numerous reports for the Belgian Army. One of the men there is a well-known Belgian mathematician and a Cambridge graduate. Then there are numerous *brancardiers* and hospital orderlies. Most of these are Belgian soldiers, but two I know of used to be teachers in Belgian schools in the territory now occupied by the Germans. As at Dunkirk, boy scouts are of great service.

Numerous ambulances bring in the wounded from the front. Formerly these were driven by a band of American ambulance men attached to the 3rd Division of the Belgian cavalry, but this has moved and they have accompanied the soldiers. Now most of the cars are run by Englishmen. One is a man, of over sixty I should say, who brought out his own cars, and now risks his life nearly every day in passing along the roads which are shelled. Dr. Depage's son drives a motor to and from Calais or Dunkirk to get stores and mail, and to convey Belgian officials about. One cannot be too careful, and the joke was rather on me the other day, when I offered a very small tip to a Belgian driver soon after I arrived. He refused it with thanks. Later I heard that his father is a Belgian financier and one of the richest men in the country.

The dressings occupy nearly all our time in the mornings. The severe wounds we dress in one of the two operating rooms down stairs. However, we are not yet above running to the windows to see the soldiers returning "from the trenches" along the road which runs between the sand dunes. Sometimes there are Zouaves or Arabs in picturesque uniforms, and often we see the *mitrailleuses* on bicycle wheels drawn by the sturdy Belgian dogs. At low tide the soldiers drill on the sands and occasionally there is a review of about three thousand men, with bands playing and colours flying, and the King appears. We do not now pay much attention to the aircraft of the allies, but when a German machine appears we all run outside. The *mitrailleuses* and guns fire at them from points close by and it is most interesting to see the shrapnel burst apparently close beside them. The little clouds of smoke remain visible for several minutes ofter the explosion. One morning we saw sixteen on their way to Dunkirk and England. So far we have seen no Zeppelins, but a British dirigible flew over us the other morning. Lunch is a substantial meal in Belgium, and from half past one till three o'clock is the holiday time for the Belgians. During this pause we generally manage to go out for an airing. So far the weather has been remarkably fine with little rain, much sunshine, and one or two small snow flurries..

Sentries are posted every few hundred yards along the shore or ride up and down on horseback, but with a slight delay whilst the soldier looks at our pass-port, we may generally pass on. Down the coast one can walk to the next village of Braydune. The day I was there a German "Aviatik" had been brought down after an exciting battle with British machines in mid-air. A bullet struck his gasoline tank and the German aviator must needs descend gracefully amongst the dunes to be captured by the Belgian soldiers who scampered after him.

Last Sunday I managed to walk to Furnes. It had been shelled the day before and there was no telling at what moment the Germans might begin again. The town was not altogether deserted, though on the road there we passed refugees in various kinds of delapidated vehicles and little carts drawn by dogs. It is extraordinary that so many of the poor inhabitants stay there when they might easily flee away, and should do so. In the little shop where we got some post cards, the woman told us that she just escaped down into the cellar when the shells began to fall. We saw bags of straw and sand, placed in front of the cellar windows all along the streets as a protection against the flying metal or fragments of stone. Happily the fine buildings in the "Grand-Place" seem to have been untouched. But nearly all the windows in the town are broken and some of the houses completely ruined. It was all a very sad sight.

Two or three times a week the Queen visits the hospital accompanied by an army officer. She enters every room and goes about it in a very simple way, conversing with the wounded Germans as well as Belgians, asking what regiment each belongs to and where they were wounded. And she has a very good memory for what they have told her and recognizes them, even if they have changed rooms, on her next visit. It falls to our lot to tell her a little about each patient, bearing in mind that her father was a distinguished surgeon, and that perhaps she knows more about wounds than one would first expect. We also help to distribute the cigarettes and books which she always brings with her. Last Sunday the King paid us his first visit and we were all introduced. He is a splendidly tall, good-looking man and appears every inch a soldier. He lives amongst his men and risks his life on many occasions, whilst encouraging them.

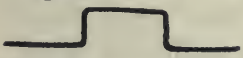
Soon after dinner is over we are all glad to get to bed, though we did stay up on New Year's Eve to see the New Year in at Dr. Depage's villa. As twelve o'clock struck we all shook hands and wished each other *bonne année.* It is not easy to think that it can be a happy year for the Belgians. Another evening there was also most interesting. M. Paul Hymans, the Belgian minister of state (just appointed minister to England), who was staying in La Panne, told us some very interesting things about the days just before war was declared. He was one of the committee that visited Canada and the United States. He told me about his visit to Montreal and his address in English before the Canadian Club. We are quite lucky to meet some of these occasional visitors; and I might remark that many officers like very much to come to the hospital for a good square meal.

There is a search light on the sands close to us, and it is a beautiful sight to see them searching out the sea with it. Not a hostile ship have we seen yet, but there are friendly gunboats near shore every night now. Of late they have taken to sweeping the skies too with the search light. Some people gifted with a good deal of imagination saw a Zeppelin, but it was merely a star, and try as we could, we were unable to see it move. A short time since there was very heavy firing, up the coast, every evening and we watched the reflection of the bursting shells. After we got into bed how the house did shake and the windows rattle! Coupling this with the fact that the wounded have told us that, the night before they came, they could see from the trenches the lights of the top story of the hospital, it brings home to us that we are really close to the battle line. We have orders now that no lights must be shown from the windows which look out on the sea.

To turn to the patients and the work. This hospital is intended for severe cases, which require immediate attention and, generally, operative treatment. We get the wounded direct from the front, though perhaps from only about ten miles of the line, and sometimes they are here only two hours after being injured. As soon as they are fit to be moved they are "evacuated" to Calais and there convalesce in the "Jeanne d'Arc" (also organized by Dr. Depage) or in some other hospital. I trust that all we send away ultimately recover but it is a disappointment not to follow the cases till the end. The vast majority of wounded are Belgians, but we always have some Frenchmen in the wards and a few Germans. At present, after the taking of the "Grand Dune" near Nieuport, there are some Turcos in the hospital as well. One Englishman attached to the Belgian Army, with a bullet through the lung, was our only British case so far and he, poor fellow, only lived a few hours.

The saddest cases are perhaps the civilians that are brought to us. One woman we have now recovering from a shell wound in the thigh. She has little to look forward too, as her husband and three children were all killed by the shell which wounded her, and only one small girl remains of her family. Then there is a little baby of two years in another ward, one of whose feet had to be amputated whilst the other has been wounded, also one arm. At least two nursing sisters have come from Furnes and one has died. The Germans were shelling the railway station as a point of importance, and quite naturally the hospital close by was hit. A nurse and various patients were sent to us. It is very convenient to have a hospital close to the station, as so many are, but very dangerous, and I think the point should be considered. Another poor woman was shot through the stomach and intestines by fragments of shell, her right arm fractured in many places, likewise one leg, and besides all this she had two large gashes in the other thigh and foot and the other hand was wounded. She died not many hours after leaving the operating table.

Up to date on our ward we have had about one hundred and twenty cases, but it will be convenient to discuss the first hundred. Most of the wounds have been caused by fragments of shell; only nine were wounds from rifle bullets. Broadly speaking, bullet wounds are cleaner than the others for the fragments of shell are rough and carry in more clothing, though one must admit that lately several cases of gas gangrene in the hospital have wounds caused by the kick of a horse and several automobile accidents.

It is of interest to note that we have had fifty-five wounds of the lower extremity and only twenty-nine of the upper. As a general rule wounds of the arm are less serious than those of the legs for the reason that the trousers, socks, and boots are dirtier and cause more infection than the clothes of the upper extremity. Of these cases thirty-two have been compound fractures. The fracture cases have done well on the whole, though practically always there has been suppuration. Several have had gas gangrene and one tetanus. The vast majority of fractures have been put up in plaster of Paris, leaving large openings for dressings and irrigation. This is accomplished by bending light wire splints thus  one for each side of the limb, bandaging firmly to the plaster above and below and reinforcing them with soft plaster. It is an extremely good method and by its means we have been able to maintain good apposition of the bones. There is no movement of the fragments and the dressings are rendered much less painful. One man with compound fracture in the middle third of the right thigh and also compound fracture of both bones in both legs, presented a difficult problem, but a double spica was applied and both limbs encased in plaster, leaving the three sites of fracture open. To make the "construction" more solid three wire splints were also firmly fixed between the thighs and legs, and now the patient may be turned about in any direction; both legs may even be lifted up together and allowed to drop back on to the bed without causing any pain. He has been with us for a month and his plaster has been exhibited by Dr. Depage to all our medical visitors. Suppuration has practically ceased and the wounds have closed in well. In another case of fracture of the thigh gas gangrene set in and the wound had to be opened up very widely on the posterior surface. He was soon put in plaster and the dressing was no longer a horror to the patient. Now the wound is closing in splendidly, though it still measures about eight inches by five inches and there is only a trace of pus on the gauze each morning.

There have been sixteen cases of head wounds ranging from slight scalp wounds to fractures of the vault of the cranium and fractures of the base of the skull. There have been five operations for trephining; and two cases have died from the results of fractured base. I remember one case which showed very pettily on trephining an almost minute fracture of the outer table, for the bullet had not penetrated the skull, but a depressed fragment of the inner table about an inch square. The patient did very well.

Wounds of the neck have been rare in the hospital, for in our ward we have only had two, one of which died from hæmorrhage from the internal jugular vein and air embolus (?). The bullet entered close to the angle of the right jaw and passing downwards and inwards, remained lodged just below the hyoid bone. It was reached and extracted with long dressing forceps, a large piece of jagged metal; hæmorrhage ensued, respiration ceased, and the patient died on the operating table.

We have had four wounds of the thorax and all have recovered. It seems a wise policy to leave the chest cases alone as much as possible. One man with a bullet wound in the upper part of the right chest in front and with no exit wound, was given morphia and an iodine dressing was applied; he spat up blood for several days, had signs of fluid in the right axilla, coughed up yellow foul-smelling sputum, and had some fever and rapid respirations for a week and a half, but recovered completely without any operative interference. Another man was wounded by a rifle bullet which entered the left arm just at the lower point of the insertion of the pectoralis major and which passed somehow through the left chest, making quite a large wound of exit behind, just inside the angle of right scapula, through which air rushed to and fro on breathing. Through this slanting wound a tube covered firmly with gauze was inserted into the left chest and after a few days the patient was discharging pus through the tube, but the wound in the left lung was closed up. He picked up after a week or so, but at the time of writing the wound is still discharging, movement is lagging at left base, and resection of a rib will have to be undertaken. He is up now in a chair for a few hours each day.

The wounds of the abdomen are very serious and the results after operating on cases of intestinal perforation have been anything but satisfactory. It is the opinion of at least one field surgeon that abdominal cases have a better chance of recovery if they are left for hours on the battle field than if they are immediately jogged off in an ambulance. Not one of our cases of intestinal perforation has recovered. All have been operated on and all have died. Sometimes there are only two or three perforations accompanied by hæmorrhage from the mesenteric vessels, but I saw Dr. Depage carefully suture up and resect bowel for sixteen perforations in one case, where there was a hernia from the wound of exit of about twelve inches of small intestine. In the other wards, however, several cases have recovered after operation with suture and resection. Our cases were all drained and intravenous and intramuscular salines administered, but they have died from general peritonitis on the first or second day after operation.

Altogether we have had twelve deaths out of one hundred cases: two from fractured bases, one neck wound, one case on the first day where all muscles about the shoulder joint were torn away by a shell, five from intestinal perforations, one from shock and hæmorrhage after multiple fractures of legs, and two from gas gangrene.

We have had five cases of gas gangrene in this series of which two have died; two have been saved after having their arms amputated and one, the case of fracture of the femur, is convalescing and has kept his leg. In all these cases the bacteriologist has found in the pus the bacillus aerogenes capsulatus, and on one or two occasions it has been cultivated from fragments of clothing adhering to the fragment of shell on its removal. In both of the arm cases the metal was removed from the forearm and the track curetted and cleansed with tincture of iodine. The next day the temperature had risen and the pulse was quicker, the wounds discharged bubbles of gas of the peculiar odour and thin reddish pus, and the arms above were discoloured. The arms were opened with large incisions and irrigated with 10 per cent. chloride of zinc. Dr. Depage prefers this solution to one of carbolic. The next day the discolouration had increased proximally and distally, and the arms were amputated at the shoulder joint. During the last week or so we have almost been in despair as gas gangrene has appeared on several wards in apparently simple wounds, which had been thoroughly scraped and cleaned out with iodine under anæsthesia, and simple rifle bullet wounds of the forearm and leg have not been immune. Practically all the cases of gas gangrene have been in men wounded at Nieuport. The quarters are dirty there and the men often live huddled together in cellars, which may account for the infection. In Constantinople during the Balkan war, Dr. Depage says that they did not find it necessary to curette every simple rifle bullet wound. We have lost several cases lately (not included in this series) even after amputation of the limb. Now we are endeavouring to stay the spread of the infection by opening the wound widely, employing irrigations of zinc chloride and injections of oxygen into the tissues, and by making circular incisions of the skin, and subcutaneous tissues above the areas of discolouration. Gas gangrene and not tetanus is the problem with which we have to contend.

On our ward in the first one hundred cases we had only one of tetanus. This developed in a boy on the twenty-first day after having been wounded by a shell which caused a compound fracture of the thigh. With injections of the serum he soon recovered, and at most only had slight stiffness of the neck and jaw muscles. There have been four cases all told so far in the hospital out of four hundred cases treated, and only one has died. One interesting case recovered from gas gangrene (wounds in the thigh and back) only to show symptoms of tetanus on the sixteenth day after admission. He was given chloral and antitetanic serum (4,500 units for three days, 3,000 for three days, 1,500 for one day) and at the end of that time could raise his head and the stiffness in the back and neck had practically disappeared. He is now convalescing. We have been giving the serum as a prophylactic measure only to very severe cases, but now we will have enough for a dose of 1,500 units to every case that is admitted. I cannot find that any case, having received a prophylactic dose, has had symptoms of tetanus.

THE sixty-first annual meeting of the American Medico-Psychological Association will take place at Fortress Monroe, Virginia, May 11th to 14th, next, under the presidency of Dr Samuel E. Smith, of Richmond, Indiana. The secretary-treasurer is Dr. Charles G. Wagner, of Binghampton, New York.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Journal of Medicine and Surgery, March, 1915:

A visit to the Mayo Clinic	J. N. E. Brown.

The Public Health Journal, March, 1915:

Recent developments in sewage disposal	G. W. Fuller.
Some aspects of whooping cough	G. A. Campbell.
Are our nurse training schools educative	M. A. Mackenzie.
The efficiency of horses on active service in Canada	C. H. Higgins.
Notes and queries	H. D. Mathias.

The Canada Lancet, March, 1915:

Pscyhiatry as a public health problem.	
Some experiences with shotgun wounds	F. N. G. Starr.
The internal secretions	J. Ferguson.
Fractures of the extreme lower radius and, perhaps, ulna	A. A. Beatty.

Western Canada Medical Journal, March, 1915:

Infant feeding during the first six months	E. Richardson.
Infant feeding from six to twelve months	R. F. Rorke.
Immunity in tuberculosis	E. R. Baldwin.
The health of the school child	W. E. Struthers.

Western Medical News, March, 1915:

Intestinal anastomosis	E. A. Hall.
Hernia into the mesentery of the sigmoid	J. C. Black.
Pediculosis: lousiness: lice	J. Alex. Rose.

Dominion Medical Monthly, March, 1915:

The medical officer of health and the inebriate	Geo. Elliott.
Army surgeons, Attention! A positive method of preventing and curing purulent infections	C. H. Duncan.

Medical Societies

CANADIAN MEDICAL ASSOCIATION

As explained on page 313, it is probable that the Annual Meeting, which was to take place in Vancouver, July 6, 7, 8 and 9, 1915, will be postponed. Definite announcement will be made later.

ONTARIO MEDICAL ASSOCIATION

THE meeting of the Ontario Medical Association will be held in Peterborough on May 25th, 26th, 27th and 28th next, and the Provincial Health Officers' Association, under the presidency of Dr. Hall, of Chatham, will hold its meeting in Peterboro also during the same week. The joint meeting of the two Associations will secure a very large attendance of the profession throughout the province, and will probably result in single fares being obtained for the delegates.

The accommodation for these meetings will be unusually good as the committee of arrangements have succeeded in obtaining the use of several large halls, as well as of the Armouries, all of which lie side by side, and are but a short distance from the hotels.

The Committee on Papers and Business, under the direction of Drs. H. J. Hamilton, of Toronto, and G. C. Cameron, of Peterboro, has already had several meetings, and the programme is in an advanced state. It is expected that about ten papers will be read in each of the main sections, and the names of readers already secured ensure a programme of great interest.

On the evening of the first day, there will be a public welcome given by the city of Peterborough, and a public address on some health topic will follow. The President's Address will come on the second day.

Provisional Programme

Tuesday, May 25th—Registration.

Wednesday, May 26th—Morning: Registration. Afternoon: Business, General Session. Evening: General Session; President's Address; Address in Medicine.

Thursday, May 27th—Morning: Sectional Meetings. Afternoon: General Session; Business Meeting; Address in Surgery. Evening: General Session; Symposium on the Heart.

Friday, May 28th—Morning: Sectional Meetings. Afternoon: General Session; Business Meeting.

The following contributions have been promised:

General Sessions—

I. Address in Medicine, by E. C. Rosenow, Chicago—"Variations in streptococci and their elective localizations in man and animals."

II. Symposium on Heart:

1. "Recent physiological findings in heart disease." T. G. Brodie.
2. "Syphilis of the heart and aorta." A. McPhedran.
3. "Auricular fibrillation." A. R. Gordon.
4. "Treatment of a fever heart." H. B. Anderson.

III. Address by Adam H. Wright, Toronto—"Medical education, with reference to the specialties and fee-splitting."

Sectional Meetings,—

I. Section in Medicine:

1. "The relation of the mental hospital to the general practitioner's work." Harvey Clare, Toronto.
2. "Pyloric Stenosis—diagnosis and treatment." Alan Brown, Toronto.
3. "The relation of school children to the tuberculosis campaign." J. H. Holbrook, Hamilton.
4. "Serum therapy," W. Goldie, Toronto.
5. "The use of radium and trichloracetic acid in dermatology." W. H. B. Aikins, Toronto.
6. "Observations on blood pressure." Dr. Emmerson, Goderich.
7. "Exophthalmic goitre," Dr. D. Smith, Stratford.
8. "Clinical manifestations of cerebro-spinal syphilis.'' T. G. Phillips, Cleveland, Ohio.

Papers have also been promised by Drs. Lyman, Ottawa; W. L. Bray, Raybrook Sanitarium, and J. W. Campbell, Kingston.

II. Section in Surgery:

1. "Some observations on the direct transfusion of blood." A. Primrose, Toronto.

2. "Tendon fixation in infantile paralysis." W. E. Gallie, Toronto.
3. "Local and spinal anaesthesia." J. R. Parry, Hamilton.
4. "The saccular theory of hernia." Dr. Etherington, Kingston.
5. "Simple goitre and its treatment." F. N. G. Starr, Toronto.
6. "The treatment of Pott's fracture." George Wilson, Toronto.
7. "Renal tuberculosis—its diagnosis and treatment." Robin Pearse, Toronto.
8. "The treatment of arthritis." Dr. Seaborn, London.
9. "The principle of the surgical treatment of exophthalmic goitre." W. J. McDonald, St. Catharines.
10. "Empyema." W. A. Brown, Chesterville.
11. "Surgical aspects of neurasthenia." Dr. Fredericks, Peterborough.

III. Section in Obstetrics and Gynæcology:
1. "Scopolamine-morphine narcosis in obstetrics." J. G. Gallie, Toronto.
2. "Serious vomiting in early pregnancy." K. McIlwraith.

Papers have been promised by Drs. E. K. Cullen, Detroit; J. R. Goodall, Montreal, and Geo. S. Cameron, Peterborough.

IV. Section in Eye, Ear, Nose and Throat:
1. "The treatment of tuberculosis of the larynx." Dr. Morton, Hamilton.
2. "The use of the electro-magnet in ophthalmic practice." R. A. Reeve, Toronto.
3. "The use of the broncho-tracheoscope and oesophagoscope in treatment." George Biggs, Toronto.
4. "Case reports." F. C. Trebilcock, Toronto.
5. "Ocular manifestations of disseminated sclerosis, with case report." Colin Campbell, Toronto.
6. "Demonstration of accessory sinuses diseases." Angus Campbell, Toronto.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The fourth regular meeting of the society was held Friday, November 20th, 1914, Dr. W. F. Hamilton, president, in the chair.

Pathological Specimens: Series by Dr. Horst Oertel.

1. Heart from a case of pyæmia following purulent arthritis of the right knee. Shows abscess in the interauricular septum. Pyæmia caused by extension of purulent infiltration from knee upwards following sheaths of blood vessels into pelvis where it had produced a rather large abscess. It is not very infrequent to find abscess in the interventricular septum but it is rare in the interauricular. There existed considerable purulent infiltration of the musculature of the septum, immediately anterior to the foramen ovale which extended down producing two definite abscesses at the base of the posterior flap of the mitral valve. A streptococcus was recovered from the pus and heart blood which was negative to Gram and had a marked hæmolytic power. It is unusual to find the location of an abscess in this particular spot and so far as we could find there were no definite evidences during the life of the patient which could have led to a probable diagnosis of the case.

2. Dr. Armstrong reported at the last meeting a case which presented all the clinical symptoms of typhoid perforation which at operation it was impossible to find. At autopsy there was found a rather unusual typhoid perforation in the region of the splenic flexure of the colon. The typhoid lesions are particularly prominent in the large gut. The ulcers commence in the lower part of the ileum but to a great extent are more evident and more severe down from the cæcum. In the large gut as far as the sigmoid flexure they have produced a rather honey-combed appearance of the gut due to diffuse involvement of the lymphoid follicles and lymphoid tissue throughout.

3. Kidney from a case of carcinoma of the rectum with extensive metastases in the retroperitoneal glands. On the right side these had obstructed the ureter almost completely. On opening the abdomen one would obtain the impression that there existed a large hydronephrosis on the right side but in cutting into the sac this was found not to be true but a para-renal hydronephrosis. A communication between the pelvis of the kidney and the surrounding fat capsule had been established before the establishment of a true hydronephrosis; the fluid had lifted the capsule off the kidney and the kidney was really floating in this retained secretion. Cases of perforation of the pelvis of the kidney before it comes to an actual hydronephrosis are rather rare, still rarer are the cases of perirenal hydronephrosis in which an accumulation of fluid occurs directly under the covering capsule of the kidney.

LIVING CASE: Multiple enchondromata, by Drs. J. M. Elder and L. J. Rhea.

Boy aged sixteen, multiple enchondroma of fingers of both hands; ring finger of left hand so badly damaged that amputation was necessary. These tumours grow upon the bone until there is nothing left. The tumours of the other fingers have been removed and we hope possibly that that ends it. When sent to the *x*-ray department to have skiagrams taken, Dr. Wilkins recognized the boy and on looking up his records found that he had examined him six years previously for a swelling of the left arm, which proved to be a chondroma in the upper end of the humerus. Another picture taken for comparison with that of six years ago showed that only slight advancement of the condition had occurred in that time. These chondroma are often multiple, usually grow in the hands of young people and spring from the periosteum. They have a very dark blue-white glistening appearance when cut down upon. There is often deflection of the bone, cysts often occur, they are often the site of spontaneous fracture, growth is slow and not painful. It is difficult to differentiate these growths from fibro-neuromas, from myeloma of the shaft, and from chondrifying sarcoma of bone. Removed cleanly they do not tend to recur but if any of the cells of hyaline cartilage are left under the periosteum they will do so. If there is very much destruction and invasion of the bone by the tumour it is better to amputate. This is the second case we have had in the General Hospital this year, the other case, a man, had had some of these tumours removed before.

DISCUSSION: Dr. L. J. Rhea: The specimen shows the growth on both sides of the bones of the finger removed. Histologically these tumours are cartilaginous in nature. The interest in these tumours from a pathological standpoint is considerable. Tumours of the cartilaginous type fall into two groups, chondroma and enchondroma. The first occur where cartilage is normally found as in the arms, fingers, and occasionally in the cartilage of the trachea. The others are definite tumours and do not necessarily arise in anatomical situations where cartilage is normally present, e.g., in the carotids, in the testicle and ovary. There are those who claim that these latter where they appear outside the normal anatomical situations for cartilage, are really mixed tumours; there are others who believe that connective tissue can undergo metaplastic changes and give place to tumour cells of a cartilaginous nature. While these tumours are benign, are encapsulated, and fulfil all the features of a benign tumour still they may form metastases. Some time ago I showed a single enchondroma in an old man that occurred only on one finger. Occasionally cartilaginous tumours break down and a sinus forms which is difficult to heal.

Occasionally these tumours are infected and are followed by a general infection. When one recalls the fact that cartilaginous tumours have a very poor blood supply their tendency to break down is not difficult to understand.

Dr. Elder exhibited skiagrams taken of the hands and arm.

Paper: The paper of the evening was read by Dr. Howard Pirie on the present status of radio-therapeutics.

Discussion: Dr. W. A. Wilkins: Dr. Pirie is to be congratulated upon the able manner in which he has brought before us to-night the very interesting subject of radio-therapeutics; in fact, so thoroughly has he done this that there is practically nothing further that one may say. I will therefore confine my remarks to my personal experiences. Before coming here to-night I reviewed the cases treated by me during the present year. It was seen that it was possible to divide the cases into two classes, namely, the superficial lesions and the deep lesions. In the first class we have our best results, some of which are almost brilliant, as in favus or ringworm and frequently the rodent ulcer. The *x*-ray treatment of these cases is now ancient history and a routine procedure. These good results are due to three reasons: first, the conditions are superficial, second, they are non-malignant, and third, the *x*-ray tube is rich in soft rays which are absorbed and act upon the superficial tissues. In deep lesions we have the opposite conditions prevailing, namely, the lesions are deep and inaccessible; they are generally malignant, and the *x*-ray tube is poor in hard or penetrating rays. I have made it a rule never to treat any condition which is amenable to surgery, and as nearly all the deep lesions which I am called upon to treat are malignant and inoperable, the results are naturally disappointing. I am able to say, however, that as the average time these patients are under treatment is increasing, we are able to prolong life to some extent and, with the constant improvement in tubes and apparatus, we are able to deliver larger quantities of deeper and more penetrating rays and we are obtaining success. Dr. Pirie has mentioned one class of cases which is engaging the attention of *x*-ray workers to-day, namely, uterine fibroids. My experience has been very limited, but I believe we have reasonable grounds to be more hopeful here. One point should be borne in mind, and that is the age. Under forty they are really not *x*-ray cases. In closing I would like to emphasize one point in reference to malignant conditions, namely, that we do not see the cases soon enough to expect any benefit from *x*-ray or any other form of treatment. It should be a routine procedure to refer cases of malignancy to the *x*-ray department soon after operation. When we see them, secondary recurrences have taken place, they are inoperable and absolutely hopeless. If we saw them before secondary involvement, we could institute prophylactic treatment and have reasonable grounds for a more hopeful outlook.

Discussion: Dr. C. K. P. Henry: I would like to hear of Dr. Pirie's experience in the treatment of acne vulgaris and psoriasis with the *x*-rays.

Dr. J. Appleton Nutter: I would like to ask Dr. Pirie's opinion of the reports from Pittsburg of the wonderful improvement in rheumatoid arthritis by the *x*-rays.

Dr. G. E. Armstrong: We have all been extremely interested in hearing the position of radiation from radium, mesothorium, or *x*-rays in medicine as presented to us to-night. Dr. Pirie has been delving in a literature that most of us see comparatively little of. It is evident that radiation is making progress and gives promise of doing still more. The part that I have been more particularly interested in is its action on malignant disease. It seems to be able to cure superficial lesions, particularly the mild forms of rodent ulcer which is now called epithelioma. And this is perhaps because, being superficial, it gets all the soft rays which do not do damage to the normal cells. And this suggests that if we could get rid of the harsher rays and have the soft rays more penetrating we could get a good deal of benefit from it in deeper lesions. I have seen radium and *x*-rays used in cases operated on and the benefits are worth while. The relief of pain alone is worth a good deal; there is very often also a retarding influence and even though the condition progresses the end comes much later. The literature I have seen is not so promising as that quoted by Dr. Pirie. In von Eiselberg's clinic a report says, they are losing faith in this treatment. It has not accomplished what it promised to do and the number of cases in which they see fit to recommend it are fewer in number. They started off with a tremendous quantity as a dose, 10 or 12 thousand milligram hours and now they have got down to 15 or 20 hundred milligram hours. If a large quantity is buried for any length of time it is too destructive. There is nothing selective in the action of these rays, they are destructive alike to all tissues that come within their influence but the cells of a tumour being more or less degenerative suffer more quickly. Fistula may follow the burying of a mass of radium and they had eleven cases of hæmorrhage, one or two of which were fatal. The reports in surgery are not as promising as we would like to have them. Dr. Chipman asked about operations for recurrence in malignant disease. There are operations for recurrence that are certainly worth while. Cases of breasts are sometimes operated on the second time with freedom from further recurrence for a long time afterwards, and even a few a third time. The same in cancer of the tongue, and Mr. Butlin who did so much work on cancer of the tongue and throat records cases of two, three, four and even five recurrences with operation which have done well. Radiation after operation is probably a good thing but von Eiselberg states that radiation after operation has in some of his cases hastened a recurrence, possibly by creating a local hyperæmia. That perhaps may be avoided by improved dosage. I would be willing to try radiation in these cases, in moderate doses, not enough to produce a marked hyperæmia and certainly not strong enough to be destructive to any normal healthy tissue cells.

Dr. J. L. Mason: It is our routine as far as ringworm is concerned to refer such cases to the *x*-ray department. The scalp is divided into five areas, one over each ear and three others in the centre. One pastile dose is given to each and the whole scalp treated, as it often reappears when a limited space only is treated. In lupus vulgaris and rodent ulcer radium or *x*-rays is used but in the former disease it only leads to a certain amount of cure, in rodent ulcer there has always been a healed area. In psoriasis recurrence is inevitable. In acne indurata good results are obtained.

Dr. H. Pirie: Acne vulgaris responds very well to *x*-ray treatment and relapse does not occur. The disease grows in the sweat glands and by partially destroying them the food for the germs is lost; they die and the condition clears up. I have had very satisfactory results with *x*-ray treatment of acne. Psoriasis is not so satisfactory as it comes back again. In regard to rheumatoid arthritis I do not know of any cure. Radium emanations in arthritis deformans has been tried by drinking the radium emanations. The selective action of *x*-rays may be compared to the effect of heat on metals. If you take a pot and put into it pieces of lead and pieces of copper and raise it to a high temperature the lead will melt before the copper, so the *x*-rays will affect one cell before another, but it kills both in the end if enough rays are applied. That *x*-rays may hasten the growth of carcinoma has been noted. The stimulating effect of rays is seen in experiments on the hair. Small doses stimulate, larger doses weaken and the hair falls out though it will grow again, and still larger doses destroy it permanently.

CASE REPORT: Two unusual cases of typhoid perforation, by Dr. A. Bazin.

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ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PHTHISIS

By C. D. Parfitt, M.D., C.M., and D. W. Crombie, M.D., C.M.

Gravenhurst, Ontario

Part II

(*Continued from page* 287)

THE methods of producing artificial pneumothorax are those of the three pioneers in the field. These have been subject to slight modification of apparatus and technique by numerous later workers, and thereby the ease and safety of the operation have been much improved. Forlanini's method[10, 22] is that of puncture with a small aspirating needle which is connected by tubing with a vessel containing nitrogen. The gas is displaced by water subjected to pressure produced by means of a rubber bulb. Originally he used a manometer which only showed the pressure at which the gas was introduced. The point of the needle was determined largely by art, by the free entry of gas under slight pressure, or by the automatic aspiration of gas because of the negative pressure present in the pleural cavity, and, when in doubt, by attaching a syringe to the needle and using suction to determine whether or not its point was in a blood vessel. Latterly he has adopted manometric control. Murphy[8] originated a very similar method. He first punctured the derma with a tenotomy knife, introduced a trocar, with cannula attached to a vessel containing nitrogen under hydrostatic pressure produced by gravity, withdrew the trocar when the rib was reached, and then pushed the cannula, with gas pressure already turned on, into the pleural space. When the parietal pleura was punctured, gas would flow freely unless there were adhesions. These original methods were obviously liable to cause gas emoblism, and did so. This danger led Brauer[43] to adopt a method of dissection down to the parietal pleura. To this method he has given Murphy's name as well as his own. The perforation of the pleura is then made by a blunt trocar with an opening in the side and gas is introduced, controlled by manometric observations. For refilling the pleural cavity he simply punctures with an ordinary aspiration needle. He and Spengler, his associate, are emphatic upon the need of using this "open" method for the original introduction of gas. There are obvious disadvantages beside the greater possibility of infection. Numerous infections of the wound and pleural cavity have occurred, four cases of pyothorax in eighty operations is one record (Saugman[44]), and accidents from gas embolism have, nevertheless, happened. A majority of cases of gas embolism have by both methods occurred during refills. Brauer's method has not been able to compete successfully against that of Forlanini as modified by Saugman[45] and others. The latter uses a water manometer so connected that it gives accurate information at all times about the conditions at the needle point and the pressure of gas.

The home-made apparatus here illustrated has proved entirely practical and we were obliged to make it from materials at hand or easily obtained. It embodies principles of construction developed by Lillingston,[11] and Robinson and Floyd.[12] Most continental apparatus are made with glass parts which cannot be easily replaced if broken, and in most of them pressure on the gas is made with a double rubber bulb. By raising a bottle containing water connected with the gas reservoir the pressure is more easily regulated than by a bulb.

The simple arrangement of syphonage enables anyone to make an apparatus with ordinary bottles. A sliding shelf was formerly used for raising the water bottles; but the levels of liquid are more readily adjusted by means of the rod and set-screw. Good black rubber tubing with fairly stiff wall will not require renewal under eighteen months. It must fit all connexions snugly; three-sixteenths inch is a convenient size. When not in use, open ends are stopped, where necessary with glass rods rather than by clamps.

Hoffman's clamps, wired to the walls, have proved better than gas cocks and may always be released when the apparatus is not in use. A gas cock (A) has been placed on the syphon tube (B) in place of a clamp only in order to save the tubing. A three-way cock may be preferred to the arrangement of clamps (C D E) used here; but it has disadvantages. If one should be used the boring of it must permit the gas reservoir, manometer and needle to be connected at the same time. The three-way cocks in some of the apparatus suggested do not permit gas to flow and intrathoracic pressures to be registered simultaneously. Any interruption of the record of intrathoracic pressure might be highly dangerous. The clamp (C) which controls the flow of gas from the reservoir

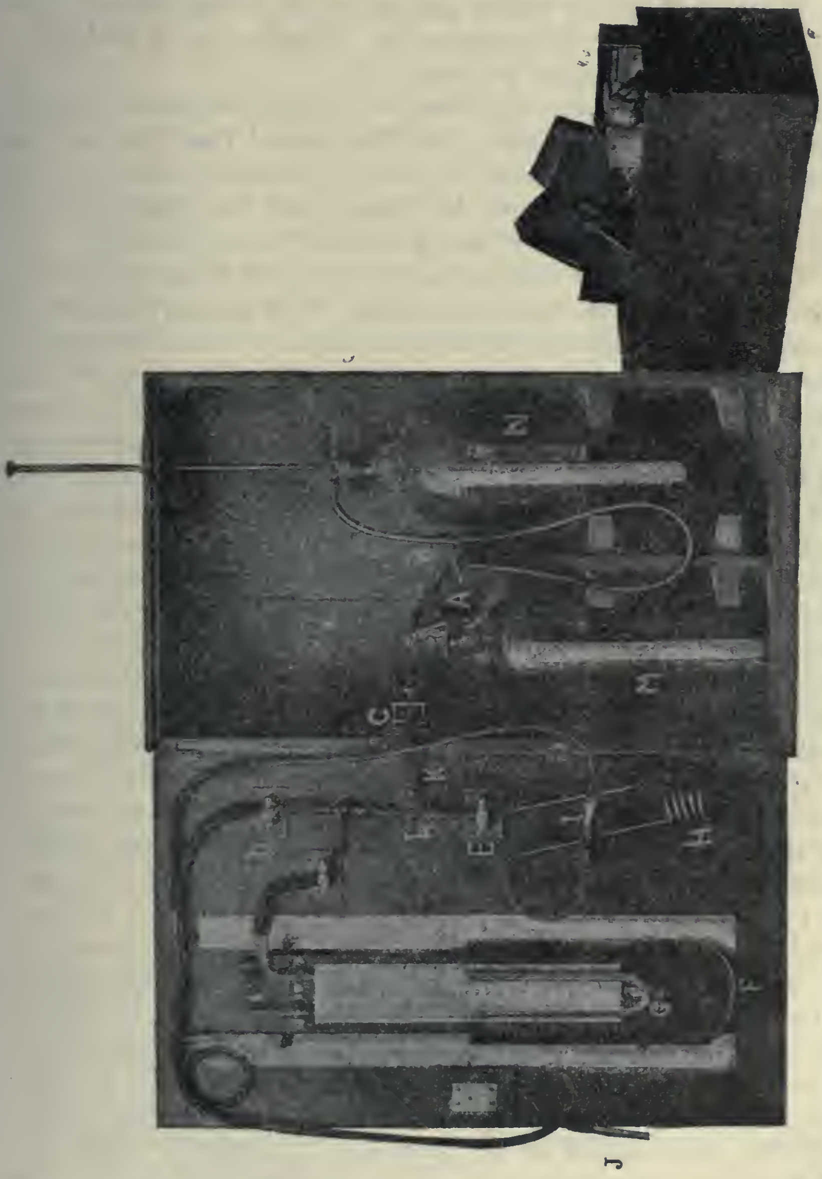

Fig. 1—Authors' Portable Apparatus

allows a very nice adjustment of the rate of flow, quite independent of the pressure exerted by the water. The clamp (D) to the water manometer permits the reduction of oscillations to a minimum, quite as well as the similar clamp placed on the tubing between the limbs of the manometer, as suggested by Würtzen and Kjer-Petersen[46] for obtaining the mean pressure.

Saugman's long water manometer (F) along with a mercurial manometer (G) is safely carried on the door. The bore of the manometer tubes should be about 3 mm. It is desirable that only a very small amount of air should be given up by the yielding water column. The ordinary glass tubing we have used is rather too large. The water in the manometer is coloured with picric acid which does not fade as the aniline dyes do. The mercury manometer is useful if the patient is inclined to cough. (1 cm. Hg. equals 13·6 cm. H_2O.) Formerly it was used for high pressures which have now been largely abandoned. It is of large size in order to replace the water manometer in case of need. Both the manometers are stoppered with corks and the clamps closed for travelling.

The coil of copper tubing (H) can be placed in an ordinary jug filled with water at about 120° F. Brauer urges that warmed gas should be used to prevent pleural shock, as one of his misadventures could be attributed to the use of cold gas. This might be a possibility where gas is introduced into the pleural cavity as in Brauer's initial operation, when the parietal pleura is exposed by dissection. It is an improbable accident, however, when the needle penetrates the chest wall as, even if the room were chill, the gas, because of its low specific heat and the good conduction of the metal, would be warmed by the time it entered the pleura. We have, nevertheless, made a number of experiments in which we have closely reproduced actual conditions as to chest wall and body temperature, and found that with a room temperature of 66°F., the rate of flow of gas 1 c.c. per second, and the coil at varying temperatures from 0° to 50°C. the maximum variations of a thermometer, upon which the entering gas impinged, were not more than 0·6°C. after 300 c.c. had passed. At room temperature, without a coil, a flow of 300 c.c. in one minute caused a fall of 0·5°C.

The filter (I) is a glass tube tapered at the ends, packed lightly with cotton. It is baked in the oven and a number of them are kept on hand in large test tubes. A second filter into which a few drops of peppermint oil have been poured can also be attached readily if it should become necessary to have the information afforded by an odorous gas. The tube connecting the filter with the needle may be stoppered with a sterile glass rod (J) when the needle is detached. The stoppered end of the tube is simply dropped into an antiseptic solution to await attachment of the needle. Thus with the filter detached at the coil the essential sterile part of the apparatus may be kept sterile. When originally set up, and occasionally afterwards, all the apparatus is sterilized. The filter is frequently changed and the tube to the needle is frequently boiled. It would be an advantage to have a sterile filter between the tubing (K) and the "T" (L), as at this point the tubing must be detached in order to close the door, and to charge the reservoir.

When the reservoir is to be charged with gas the gas bottle (M) is filled with bichloride solution, or with freshly boiled water to which 2 drachms of pyrogallic acid are added to absorb any remaining oxygen, and this is displaced into the second bottle (N) by the gas. Nitrogen is most conveniently obtained in cylinders,* or may be made with but little trouble,† and is passed through bichloride solution in a wash bottle before it enters the gas bottle through the tubing which has been detached at the "T". It is questionable whether nitrogen has any superiority over air. According to Webb, Gilbert, James and Havens,[48] the nitrogen supplied in cylinders is often far from pure, and, moreover, after twenty-four hours the analyses of gas withdrawn from the pleural cavity show no material difference when either pure nitrogen or air is used. Oxygen is now largely used for the initial inflation and apparatus are made, or may be improvised, for the use of both gases. Experiments have shown that gas embolism may follow the use of oxygen; but no cases of fatal embolism have been reported by those who use it (Moreland[49]). This may, of course, be explained merely by improved technique. We have usually used air for the first inflation.

The special needles are becoming almost as numerous as the operators. For all-round work that of Floyd* has many features to recommend it. It should be obtained in two sizes, the smaller one being much more desirable for refills. We prefer the butt to be so made that a "Record" syringe will fit it. The needle designed by Kuss†[50] is ingenious and very safe for the initial operation. It is No. 3 Charrière, rather smaller than Floyd's. Moreland[49] highly recommends the small platinum needle of Braun's.‡ We have found it very useful for refills; but it has some disadvantages. Except for the initial operation we have a liking for Saugman's‖ simple needle with a rather sharp point. Modifications of the point by Lillingston,‖ and Morgan‖[51] present some advantages for the initial operation. The bore of the needle will modify the excursions of the manometer to some extent.

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* Nitrogen in cylinders may be obtained from L'Air Liquide Association, First Avenue and Ernest Street, Maisonneuve, Montreal. (We have not found that this gas contains any demonstrable amount of oxygen.)

† Nitrogen may be obtained from air by absorbing the oxygen with alkaline pyrogallic acid solution. One gram of the pyrogallic acid will absorb the oxygen from 100 c.c. of air in two hours, approximately. For each gram of pyrogallic acid, 10 c.c. of 10 per cent. caustic potash should be used. The bottle in which the oxygen is to be absorbed should be connected by a syphon with another bottle containing water. The bottles of the apparatus will serve admirably.

The decomposition of urea by sodium hypobromite solution or of a mixture of solutions of sodium nitrite and ammonium chloride by heat are other methods. Boynton[47] considers the latter much the easiest and most economical of all methods as 20 gm. of the combined chemicals yield as much nitrogen as 600 gm. by the absorption method.

All instruments are sterilized by boiling. Dry sterilization is convenient where there are facilities for it. The needles are transferred to alcohol to help their drying later, and remain there until connected with the apparatus. Gas is run through the needle when it is attached to the tubing until its bore is quite dry, the point being wiped from time to time on sterile gauze. A quick fall of the manometer to 0 after the gas is shut off shows that the bore is clear. A dry needle is essential.

For refills especially, it is convenient to have a stop on the needle. Baldwin's guard* is useful; but we find three-eighths of an inch of a soft rubber No. 3 stopper, with a small perforation so that the needle is tightly gripped, the most convenient check.

"Record" syringes of 2 c.c. content with two-inch 20 guage needles are most useful, both for the anæsthetic and to serve as aspirators, when in doubt as to the position of the needle point. A tenotomy or cataract knife, a tube of ethyl chloride and a local anæsthetic are essential. Tincture of iodine, brandy, a syringe loaded with ether, and a faradic battery, if possible, should be on hand.

A freshly prepared 1 per cent. solution of novocaine is generally recommended as the local anæsthetic. The writers have found it convenient to keep a sterilized solution in a rubber-capped vaccine bottle. The cap is wiped with concentrated lysol before the needle is introduced. The solution used is novocaine 1 per cent., adrenalin solution (1-1000) 10 per cent., phenol 0·25 per cent, sodium chloride 0·85 per cent. The ampoules of eucaine and adrenalin, and of quinine and urea, which can be purchased, are also very convenient, and both have given satisfactory anæsthesia.

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* Codman & Shurtleff, Boston.
† Collin, Paris.
‡ C. Nicolai, Hanover.
‖ Allen & Hanbury, London.

Since the precautions in the technique of the operation are mainly for the avoidance of possible serious misadventures, both immediate and remote, these may now be conveniently discussed before the details of the operation are further considered.

During the operation, or shortly following the withdrawal of the needle, a group of symptoms may arise which, while alarming, may be transitory; or they may become more pronounced during a period of hours with either gradual subsidence and recovery, or a fatal ending; or they may be immediately fatal. These symptoms vary in number, degree and combination.

They are mainly slight faintness, pallor, cyanosis, startled cry, bradycardia or tachycardia, disturbances of respiration, dilation of the pupils with loss of reflexes, transitory blindness, nystagmus, loss of consciousness, mottling of the skin, clonic and tonic spasms, facial paralysis, paralysis localized or pronouncedly one-sided, laryngeal spasm or paralysis, anæsthesia and paræsthesia.

The grouping of the symptoms in any one case may be confusing as to their origin, and their cause has been ascribed to different pathological conditions. In the discussion of cause, the prejudices of the critic have possibly at times induced too broad generalization. The Italian and French observers lay stress upon the reflexes arising from pleural shock and consider "pleural eclampsia" or "pleural reflex" the cause in most instances. German opinion, led by Brauer,[43] is strongly against such an explanation and ascribes most serious happenings to gas embolism, excepting, possibly, relatively slight symptoms and laryngeal spasm, which may be due to reflex causes. Saugman[52] also supports this view and holds that shock may only be accepted as an explanation when embolism can be definitely excluded. Proof of cause is difficult to obtain as the fatalities have been relatively few and not all these have come to autopsy, and even when they do, there are many obvious possibilities of error.

There is fairly abundant clinical proof of shock or reflex as a cause for various combinations of symptoms. This is probably due to the effect of the irritation of the operation upon an exalted nervous sensibility. Floyd[25] mentions one case of fatality, after he had anæsthetized the pleura, on the introduction of the needle, although no gas had been turned on. Both he and Lillingston[53] regard shock as the most serious danger of the operation. This explanation is confirmed by occasional instances of death which have been recorded during or following diagnostic puncture, aspiration, or irrigation of the pleural cavity, and ascribed to shock. Sundberg[54] brings some support to the reflex theory as a cause of grave symptoms of the central nervous system from exhaustive research at autopsy. He suggests that a reflex spasm of the cerebral arteries produces an ischæmia which is followed by thrombosis and softening.

Gas embolism may arise because the gas is allowed to flow when the needle point is in a blood vessel in the lung, or in a pleural vessel which opens into the pulmonary circulation. When the lung has been wounded, especially if it is infiltrated and if pleural adhesions exist, physical and physiological conditions may be such that gas can be aspirated from the needle by the yielding of the water column, and embolism may possibly occur without the gas reservoir being connected. When the lung has been wounded alveolar air may also be aspirated into the vessels, and gas may also be pressed into the vessels of such a wound from the gas cavity. If pleural adhesions are torn apart a vessel may aspirate gas or allow gas to be pressed into it. Guyot-Bourgs[55] has shown that large venous plexuses may be present in recent adhesions and that there may be some communication through them between the systemic and pulmonary circulations. It is possible that gas may enter a vein in the chest wall which has been wounded by the needle and thus find its way to the left heart. During the removal of the stylet or the clearing of an obstruction in the needle, air may be aspirated if the needle point is in a vein. Gas embolism is then at all times an imminent possibility, unless proper precautions are taken, and the danger is greatest when it is difficult to find a free pleural space, or in attempting to form one when adhesions are present. Its occurrence in the past can usually be traced to some error in technique and it is found that warning has not been taken from unsatisfactory manometric indications. The greater number of fatalities have occurred at refills. Here the depth of the needle and the presence of a known gas cavity may have been considered sufficient evidence that the needle point was in proper position, and, despite the uncertain manometric reading, gas has been turned on, with an accident resulting. The needle may have entered a reëxpanded lung unobserved, the needle may have slipped out of the cavity, or it may have impaled a vessel and have been invaginated by the pleura (Lillingston[53]).

Fatalities from the operation were naturally more frequent in the early days of this treatment. Some operators had more misadventures than others, possibly because of the selection of more difficult cases, or of some error in technique, or of simple bad luck. The actual number of mishaps is, however, small in proportion to the number of operations, and fatalities form only a small proportion of the mishaps. Hansen[56] collected 31 cases, reported in the literature up to 1912, and there were only 8 deaths. In 10,000 operations reported by Forlanini[57] on 134 patients, 2 fatalities occurred from gas embolism and 12 other cases had serious, but not fatal, symptoms. In 5,000 operations by Saugman[58] on 186 patients, 2 fatalities occurred at a first injection.

Various experiments on animals and upon the cadaver have given results both supporting and disproving each side; but the conditions of the experiments may often be criticized. They have dealt with the possible injury to the lung by the needle, the production of shock by the injection of irritating substances and the injection of various gases. It has been shown that the amount of gas necessary to produce embolism may be very small indeed, only a few centimetres.

Wever,[59] inspired by Brauer to duplicate as nearly as possible the conditions existing in man, and working with competent collaborators, demonstrated experimentally in monkeys, gas bubbles in the vessels of the fundus oculi, and gas bubbles in cerebral vessels when the animals were promptly killed; but conditions of the brain very similar to those described by Sundberg if the animals were allowed to die. He mentions cases in man, also, which showed gas emboli in both the fundus oculi and cerebral vessels following aspiration of air into vessels during severe lung operations.

Another cause of embolism, which may possibly arise from the operation because of the compression of the lung, is the detachment of a venous thrombus (Brauer and Spengler). The symptoms will probably come on some hours after the operation. It is of very rare occurrence.

Accidental pneumothorax on the treated side may be an occasional, immediate, or remote result. The needle may enter a cavity and cause a pneumothorax. In one of our cases such an accident followed the introduction of the anæsthetizing needle over an apparently healthy part of the lung, and was probably due to the tearing of the lung on the needle point from respiratory movement. A large pneumothorax rapidly became established which was then maintained by inflations. There has been no ill result.* It may be caused, also, by too great pressure causing an adhesion to tear away from the lung; from too great intrapleural pressure upon a weak spot in the compressed lung; or because the intrapleural pressure is allowed to become too low and atmospheric pressure causes a soft spot in the lung to rupture into the pleural cavity. A purulent effusion may follow all such accidents.

Other accidents which are caused by errors of technique, or which may be unavoidable, and symptoms and complications resulting from the operation, and more or less inevitable, will be taken up later.

The site for the introduction of the needle must be carefully chosen, if possible where the lung is free or relatively free from disease, and where it is movable. Painstaking physical examination is necessary. The fluoroscope is undoubtedly a help; but it is of secondary value to physical examination. Percussion is the method of most use but cannot be entirely relied upon, as there may be a deceptive shifting of the lung resonance at the lower margin during respiration when there are both parietal and diaphragmatic adhesions (v. Murhalt[60]). In the absence of shifting resonance the pleural space may, on the contrary, be free. This is quite possible after pleural effusion. For the left side, the modification of resonance over the heart during respiration may prove helpful in forming a decision about a free margin. We have had best luck between the scapular and postaxillary lines, below the level of the angle of the scapula, when there have been adhesions, since there is greater possibility of finding fissures or free spaces at this point.

To avoid the likelihood of pleural reflex, the patient should not be operated upon when in an exalted nervous condition, or near the menstrual period. Reflex excitability should be reduced by the giving of a hypodermic injection of morphia one-sixth grain, or of omnopon one-third grain, half an hour before the operation, or, when it is known that opiates may not be well borne, by giving chloral hydrate 7 to 10 grs., with half a drachm of bromide, an hour beforehand. These should be used during the first few operations. Local anæsthetics must be freely used at every puncture. The operation should not take place until some hours after food. The patient should not be allowed to become unduly disturbed, possibly not removed from his bed, and he should be placed in a comfortable position. At the first seance, not more than two punctures should be made.

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* This accident occurred after the first part of this paper giving our results had been completed.

The posture of the patient is important as intrapleural pressures change with position and vary with site. The horizontal position, therefore, is usual. The spot for insertion of the needle should be the topmost point of the circumference of the thorax in order that the gas may remain near the needle point. A pillow under the side helps to open narrow interspaces. The side should be carefully cleansed with alcohol and ether and painted with iodine. The skin is frozen with ethyl chloride, and, for the first operation when the larger needle is used, a small puncture is made with the knife so that no skin resistance may interfere with feeling resistance at the point of the needle. The needle of the syringe containing from one to two centimetres of the local anæsthetic is then introduced and the tissue infiltrated in front of the needle point. Just before reaching the parietal pleura about a minute should be allowed to pass before the pleura is penetrated. Half a centimetre more of the anæsthetic should then be injected. The needle is advanced slowly through the tissues and the several fascial layers are counted as they are penetrated by the needle. The resistance of the fibrous external intercostal is usually easily marked and the next following distinct, though slight, resistance is the parietal pleura. We prefer vertical to oblique direction for the puncture because the depth is more easily determined. Gentle suction is made with the syringe when the pleura has presumably been reached, and, if no blood or bubbles are withdrawn, the depth of the needle is noted and the needle removed. The needle guard is then adjusted to the special needle at this depth. We prefer not to use a guard at the first puncture. When difficulties are anticipated, Lillingston anæsthetizes two or three places at once as time is saved in case of failure and the puncture sites are drier.

Before using the special needle attention should be given to the following points; the needle must be dry and clear, the manometric oscillation sensitive and not interfered with by the filter, there must be no leak, the manometer levels should be at 0, the gas reservoir must be shut off, the valve between the gas and the water bottles must be open and the syphonage perfect, the bottles are to be so adjusted that the liquids of each are at the same level and the height of the liquid noted.

The needle with the stylet in position is now introduced. The fascial layers are more easily noted with the larger, blunter needle. When the external intercostal muscle has been passed, the stylet is withdrawn partly and the cock turned off before complete removal (Floyd's needle), or with Kuss's needle the sharp trocar is replaced by the blunt stylet, the needle is then pushed on to the desired depth or until manometric changes are noted. If there is a free pleural space in which the needle eye rests, the levels of the fluid change at once and follow closely the respiratory movements.

These levels should be noted on inspiration and on expiration; but it is safer not to attempt to obtain the readings for deep respiration until after a gas bubble has been produced because of the danger of injury to the lung. It may be considered desirable also, to note the mean pressure by screwing down the valve (D) to the manometer until a minimal oscillation is registered. The mean pressure is not quite the same as the mid-point between the levels at the end of inspiration and expiration, but is rather nearer the expiratory pressure because the inspiratory phase is much shorter than the expiratory. This pressure is the favoured one for record by many continental workers.[18]

The measure of the intrathoracic pressure is the difference between the levels of fluid in the two limbs of the manometer, i.e., twice the amount registered on the centimetre scale of the manometer when one limb only is read. As a practical matter it is far more convenient to record this reading of one limb only, but it must be borne in mind that it represents only half the true pressure. There is opportunity for confusion on this point, obvious though it may be, and no paper we have read makes it clear. It is possible that sometimes this half reading has been mentioned in place of the true reading. The excellent article by Rist,[61] for example, suggests just this error in the explanation of the relation of the pressure in the bottles to the manometric reading. An error in interpreting the pressures recorded might be disastrous if an operator were to follow the lead suggested in the use of high pressures by various authors. Pressures recorded in this article refer to true pressures only.

When the pleural space is free from adhesions and collapse of the lung will be easy, the right point for the eye of the needle is generally found without difficulty. The greatest caution should be taken not to wound the lung. This may easily happen because the impetus of the needle is not sufficiently checked as the blunt point perforates the resistant layers. Much force is sometimes required to penetrate the external intercostal with a blunt needle and the restraining fingers must be well on guard. This danger is least with Kuss's needle. A non-adherent lung will yield before its round point, and this is probably also the case with the larger bluntly pointed needle of Floyd. Much manipulation of the needle in attempting to find a free space is to be avoided as the wounding of tissue would create conditions predisposing to gas embolism, and the irritation might induce shock. All drag on the needle should be avoided. If distress should be manifested, or unexpected or unusual pain complained of, at any time during the operation, the needle must be promptly withdrawn.

When the oscillations are quite characteristic of a free pleural space, about which more will be said later, the valve (C) to the gas bottle is opened. Ordinary respiration will quite quickly aspirate the gas. The manometer will now show diminished but perceptible oscillations and serve as a constant guide as to the position of the needle point. As the negative pressure in the pleural cavity decreases, and the negative pressure in the gas bottle increases, so that a state of equilibrium is approached, the water bottle is raised from time to time until the levels are equalized. This is Saugman's method, which we have largely followed.

Kuss[50] goes further, and, as a safety precaution in case the needle should have entered a vein, creates a negative pressure in the gas reservoir by setting the level of the liquid in the water bottle about 5 cm. below the level of the liquid in the gas bottle. This level would be modified somewhat according to the original manometer oscillations noted. Either of these methods is to be preferred to using pressure on the gas at a first operation The aspiration method of allowing the collapse of the lung is designed to lessen the risk of gas embolism. For gas to be aspirated, however, the pressure in the gas reservoir can never be lower than the minimal intrapleural pressure. The manœuvres of Saugman and Kuss are best adapted for the class of cases in which good manometric readings are obtained and in which, therefore, there is least risk of producing gas embolism. In cases of difficulty, as will be noted later, after certain manœuvres have been undertaken, gas may have to be introduced under varying degrees of pressure. It is in these difficult cases that the danger of gas embolism, or possibly of pleural reflex, are greatest. It must be the rule that gas may never be allowed to pass the needle until satisfactory manometric readings have been obtained. When urgency and difficulty co-exist, any attempt to induce compression of the lung should only be undertaken with the patient's free consent and full realization of the dangers.

If 100 c.c. are rapidly aspirated and large oscillations about a mean negative pressure have occurred, a true intrapleural pneumothorax has surely been formed (Holmgren[62]). Several hundred centimetres may thus be readily introduced at atmospheric pressure, or less, when the space is relatively free. The gas valve is closed after each 100 c.c. has been aspirated and the readings of the manometer are noted. The readings for the extremes of respiration may now be taken and may give some information about existing conditions.

At the initial inflation it is well not to introduce more than 300 c.c. of gas. This amount aspirated never distresses the patient. The gradual adjustment of heart and lungs to the deranged intrathoracic conditions is desirable from every point of view and only urgency, as for hæmorrhages, when from 500 to 800 c.c. may be given and repeated on the next day or two, and economy of time and money warrant larger inflations. In private practice these considerations sometimes necessitate reasonable maximum amounts being given. The temptation for the operator is always to give more than an ideal amount rather than less. No doubt many patients may bear larger amounts well; but discretion can be exercised on this point. Some writers urge a large initial injection to ensure the easy finding of the space at the next operation, and to guard against possible injury to the lung, or other accident.

When the needle has been removed, a small, firm pad of gauze is strapped firmly over the puncture. A leak of gas into the subcutaneous tissues takes place more easily when the larger needle is used, than with the smaller needle used at refills; but with the small quantity introduced at the first operation unless high pressure has been necessary there is seldom trouble.

Two days later another inflation should be given, and at gradually lengthening intervals increasing amounts of gas are injected until the mean pressure is 0 or slightly positive. Several conditions influence the end point of pressure that is to be maintained. After the first injection slight pressure on the gas, of 5 to 10 cm. water, may be used, instead of continuing the method of aspiration. When inflation is well borne 1 c.c. of gas per second may be considered a fair rate of flow. Nitrogen is at first absorbed at the rate of approximately 75 c.c. daily from a normal pleura (Robinson and Floyd[12]), as time passes the amount absorbed is reduced to about 25 c.c. Fever and movement hasten while inflammation and thickening, or adhesions, retard absorption. Gas may rapidly be lost by diffusion through the wall of a large underlying cavity (Carlton and Evans[63]). A consistently maintained, but gradually increasing, degree of collapse of the lung should be aimed at. As this is impossible of realization in an absolute sense, the intervals are regulated by estimations as to the absorption of gas, by physical examinations, *x*-ray examinations, the feeling of the patient and change of symptoms. Several months may possibly pass before the interval exceeds three weeks, though in many cases this will become prolonged to six weeks.

Difficulties are, however, frequently met with, and they are at once indicated by the absence of fluctuations of the water levels of the manometer; or by fluctuations that are either not characteristic of the presence of the needle point between the layers of the pleura, or about which there is some ambiguous meaning.

There may be obstruction in the needle, needle cock or filter, from water because of imperfect drying of the apparatus; or in the needle from tissue, blood or serum; or at the opening in the needle from a valve-like block by lung during expiration. A respiration may clear the needle, and if this fails the stylet should be reintroduced to remove possible obstruction by tissue. Deep respiration to clear the needle should not be attempted, since, as suggested above, embolism may be induced thereby. Fluid may give a valve-like obstruction which causes a step-like increasing negative pressure during inspiration, with no alternating rise on expiration. A syringe may then be attached to the needle butt and aspiration made to determine if serous effusion is present. If this test is negative the needle may have to be removed and dried. When the lung blocks the needle, a feeling of elastic pressure may be communicated through the needle during expiration. Occasionally, when we have been reasonably sure that this valve-like action of the lung was the cause of the interference with proper readings and there has been a deep inspiratory fluctuation, we have allowed a few centimetres of gas to enter. Instantly proper fluctuations have taken place.

The needle point may be at the correct depth and lie in pleural adhesions or in a thickened layer of pleura when fluctuations will be absent; or, if it lies in a small fissure in the pleura there may be a great modification of them. It may not have reached the pleural space but may lie between the internal intercostal muscle and the parietal pleura and there may then be either an absence of fluctuations or modified fluctuations which are misleading; or it may be outside the intrathoracic fascia when there will be no fluctuations. It may also have penetrated the pulmonary tissue and be either in a blood vessel or in an air-containing space. The careful study of the manometer will usually enable one to determine the situation of the needle point and when the readings are ambiguous some manœuvre will generally help to make their meaning clear.

(To be concluded.)

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UTERINE HÆMORRHAGE AT AND AFTER THE MENOPAUSE

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IN considering the question of uterine hæmorrhage at the time of the menopause and after, it is necessary that one should have an idea of the normal changes which accompany the menopause and the time at which these occur. As we all know, the menopause, or climacteric, is the term applied to the change which takes place in the organism of a woman, resulting in the cessation of menstruation and of sexual activity. It is easy to define but not easy to explain. As no satisfactory explanation has ever been given for the onset of menstruation and its regular periodic recurrence, neither has a satisfactory explanation been given for the cessation of the function. Various theories have been propounded and it is not within the scope of this short paper to review these; suffice it to say that the majority of the men who have made, or are making, a study of this question, are coming to believe that menstruation is under the control of the ovaries. In keeping with this theory, the most satisfactory explanation, to my mind, of the cessation of menstruation is given by J. G. Clark, of Philadelphia. In 1899 Clark published the results of extensive anatomical and physiological investigations of the vascular system of the ovary (*Johns Hopkins Bulletin*, Vol. 10).

He injected a very large series of ovaries from individuals ranging in age from a six months fœtus to a woman many years past the menopause, and it is upon this work that his final conclusions were based. He says,—"As there is no increase in the number of follicles after birth the obliteration of each primitive or partially developed one naturally decreases the total original number, which results in an increase in the medullary portion of the ovary at the expense of the follicle-bearing or cortical zone. The law of development in the follicle is from within outward, that is, the primitive follicles lying nearest the central circulatory tree are the first to undergo development. . . . Having reached a certain stage

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Read before the Academy of Medicine, Toronto.

in their development, a retrogressive change following the degeneration of the ovum is inaugurated, and the original site, occupied by the follicle, is replaced by a very minute addition of connective tissue to the stroma of the organ, which naturally builds up through successive accumulations the central area. Follicles in various stages of development and retrogression are noted in all ages after birth, and according to my observations the same principle involved in the obliteration of the unruptured follicles before puberty governs the organization of the corpus luteum after ovulation is inaugurated. . . . What determines the cessation of these progressive changes and the beginning of the retrogressive or obliterative process remains unexplained. The fact remains, however, that with the degeneration of the ovum the liquor folliculi is absorbed and the cavity is filled in with large embryonic connective tissue cells arising from the theca interna.

"Through the gradual diminution of the blood supplied by the follicular wreath the excess of connective tissue undergoes hyaline changes and absorption until finally only a mere trace of the new-growth remains. In this way the size of the ovary is maintained within reasonable bounds. . . . In the progressive growth of the ovary the obliterative changes just referred to continue until the follicle-bearing area . . . . becomes a narrow zone compared with its width in the new-born child.

"As a conclusion to this study the cessation of ovulation is ascribed to the gradual impairment of the vascular systems, through first, densification of the ovarian stroma and second, through the retroactive effect of imperfectly removed corpora lutea, which as an end result diminishes the blood supply to the cortical area to such an extent that the growth of the primitive follicles is retarded and finally completely inhibited. These final retrogressive changes lead up to and constitute the menopause or climacterium."

In accordance with this theory we would expect the onset of the menopause to be gradual since the growth of the primitive follicles is gradually retarded and that menstruation would cease when the primitive follicles are completely inhibited. This is what ordinarily occurs, menstruation becoming either gradually less in amount or less frequent in recurrence until it finally ceases. Those rare cases where a woman menstruates regularly, both in time and amount, and then suddenly ceases, may still fit in with the theory, for here, although the change may have been going on gradually, sufficient ovarian tissue has been left to keep up a normal ovulation but this small remaining amount may come under influence of the retrogressive changes all at once and be quickly obliterated. Now the point I wish to make is that the menopause is a subsidence of the loss of blood, and all cases which present, at this time an increased flow are pathological. Unfortunately among the laity and more unfortunately even among members of the medical profession, there is a belief that mild or even severe hæmorrhages are a necessary evil associated with the menopause and may be safely left to nature's care. Nothing more erroneous than this is possible or may be so far-reaching in its baneful results.

Moreover, one must recognize the wide range of ages at which the menopause may occur, in order not to fall into error. Most authorities agree that it occurs in the majority of cases between the ages of forty-five and fifty-five. As these are foreign statistics, in order to check up whether this is approximately correct for Canada, I have looked over my last 400 case records and find 50 of these women had passed the menopause. Of these 24 or 48 per cent. were between 46 and 50; 7 or 14 per cent. between 51 and 55; 9 or 18 per cent. between 41 and 45; 5 or 10 per cent. between 36 and 40; 3 or 6 per cent. between 31 and 35; 1 at 56 and 1 at 26. I have excluded all cases in which the menopause may have been delayed by any pathological condition such as fibromyoma or carcinoma. It will be seen that my figures show the menopause rather earlier than those given by most others. For the purposes under discussion it is sufficient to mention the two extremens, 26 and 56 years, to show that the menopause may occur within a range of thirty years; consequently in considering any case of hæmorrhage, age must not be taken too much into account. If a woman, say, at forty begins to show disturbance of menstruation, it ought not to be assumed that it is just the menopause and passed over on that score, for in the normal course of that woman's cycle the menopause might not occur for fifteen years or more.

During these thirty years a woman may be subjected to all the causes of hæmorrhages incident to sexual activity, for she may bear a child at any time till the complete cessation of the flow. In fact, a few rare cases are on record of women having borne a child after the flow has stopped. It is during these years that carcinoma usually makes its appearance and that fibromyomas attain their greatest activity. It is therefore incumbent upon the medical practitioner to attempt to find the physical or pathological cause of the increased flow even if it is not severe enough to be classed as a hæmorrhage. The first duty is to ascertain if a local cause is present. It is nothing short of criminal to allow a woman complaining of irregular bleeding to go without examination simply on the supposition that she is suffering from the menopause. Any reluctance on the part of the patient must be overcome by judicious explanation and advice. No false modesty should permit the examination to be deferred. True, many of these women bleed so constantly that it is almost impossible to find opportunity for examination at a time when bleeding is absent, and most women object to being examined when they are bleeding. But the physician must not hesitate; by the use of rubber gloves and the proper arrangement of a protective sheet, it can be accomplished without shocking the sensibilities of the most sensitive patient. Besides, certain advantages are gained by making the examination at this time. The character of the blood may give some information. It may be discovered whether the blood is coming from the uterus or from a vulvar or vaginal lesion or whether it is coming from the cervix or from the body of the uterus. Should a polypus be protruding it may be seen and the whole trouble easily cleared up by its removal. If the cervix is involved with cancer a diagnosis may be made at once or if further evidence is required, a piece may be snipped off and a microscopical examination made. Should the blood be coming from the uterus itself, arrangements must be made at once to curette and have the scrapings examined. This is absolutely imperative and applies to bleeding before, at, and after the menopause; and I believe this should always be done under anæsthesia when a complete examination of the pelvis may be made, and pieces obtained from different parts of the uterine cavity, otherwise, if the part involved is small it may be missed entirely and a false security result. The importance of a very thorough examination cannot be emphasized too much, and when one considers that according to the best available statistics, one woman in every eleven after the age of thirty-five dies of cancer of the uterus, and that in 65 per cent. of all cases of hæmorrhage after the menopause, the cause is cancer, one need not apologize for reiteration. Within the last year four patients have come under my notice who had been suffering from irregular bleeding for periods varying from six to eighteen months, who had each been told by her physician that it was due to the menopause and in no case had an examination been made; in each case advanced carcinoma of the cervix was present. During the last five years I have seen ten or twelve similar cases but it was not always the fault of the physician that they were so far advanced. The women do not present themselves for examination early enough. They must be made to understand that irregular or increased bleeding is always pathological; the education of the public in this regard is largely in the hands of the general practitioner. In passing it may not be amiss to point out that the first symptom of cancer may not be hæmorrhage but a thin watery discharge which becomes serosanguinous and later, when the disease is well advanced, becomes bloody and later still foul-smelling and offensive. In practically every case of cancer, the information can be elicited by a careful enquiry, that the bleeding was preceded for some months by a watery discharge. It is only by keeping these points well in mind that we can hope to make earlier diagnoses in such grave conditions and by getting these cases early increase our percentage of cures.

In regard to fibromyomata a great deal of work has been done by various observers to explain the bleeding in these conditions. Clark (*loc. cit.*) injected the arteries with ultramarine blue in 10 per cent. gelatine. Sampson, of Albany, has also investigated a large series of cases, injecting the arteries with Venetian red and the veins with ultramarine blue in 15 per cent. gelatine; for stereoscopic radiographs he used bismuth carbonate (Mallinckrodt's) in 15 per cent. gelatine solution (*Surgery, Gynæcology and Obstretrics*, March, 1912). The result of all the experiments have shown that in order to cause hæmorrhage, a myoma must impinge upon the endometrium or seriously disturb the circulation of the uterus, and these cases are not amenable to general treatment. If a woman is fortunate enough to pass through the menopause without serious hæmorrhage or pressure symptoms, the myoma atrophies with the rest of the uterus and gives no further trouble. This fortunate result is, however, rare. In the usual course the myoma increases in size during the fourth and fifth decades and if it does not manifest its presence by pressure symptoms, it will do so by the menstruation gradually increasing both in length of the periods and in amount. The normal cycle which the woman has established is disturbed. In such cases, in early menstrual life, the highest aim of conservative surgery is to remove the growth, and by a painstaking plastic operation retain the uterus so that it may carry out the function intended for it. In the early forties and later, however, when the active child-bearing period is past, as a general rule one is safer in practising total extirpation by the route which gives promise of the greatest safety to the patient.

It is about the time of the menopause that we meet the cases which are classified as general fibrosis of the uterus. In these one does not encounter the whorled fibromyomatous nodules of which we have just spoken, but instead one finds that the uterus has undergone an increase in fibrous tissue throughout. Upon examination usually some enlargement may be detected and as a rule the uterus feels harder than normal, but it is not always easy to differentiate this condition from the hypertrophied uterus of a woman who has borne a number of children. These cases usually resist treatment and if the hæmorrhages are increasing in amount and interfering with general health, they call for hysterectomy. In this general class may be placed the cases showing arteriosclerosis of the vessels of the uterus. In some the uterus may be slightly enlarged, but often no enlargement occurs, or it may be even smaller than normal. The vessels of the uterus may show marked arterial degeneration where none may be demonstrated in other parts of the body. Palliative treatment may suffice here, but in many cases the menace to good health or even life will only be removed by the removal of the uterus.

Then we come to the cases where no lesion can be found to explain the bleeding. These are the cases which would be curetted once, twice, and perhaps a third time without any relief and which were formerly, and even yet are, so often classified under the misleading and overworked term of endometritis. In seeking to explain this condition a great deal of work has been done by various clinicians and laboratory workers. Schichele and Keller in 1912, (*Archiv. für Gynækologie*, xcv. No. 3) published the results of exhaustive research in four hundred and thirty cases and advocated dropping the term glandular endometritis. They say that there seems to be no etiologic relation between these glandular changes and hæmorrhages from the uterus; the changes were sometimes accompanied by hæmorrhage and again there was severe bleeding without these changes. The failure of curettement to cure in so many cases confirms the lack of connexion between the hyperplasia and hypertrophy of the glands and the hæmorrhage.

L. Adler writing from Schauta's clinic at Vienna (*Medizinische Klinik*, February 1st, 1914, x, 5.) states that his research has confirmed the assumption that endometritis has nothing to do with uterine hæmorrhage; the uterus proper is seldom responsible for the hæmorrhage; the ovaries, or reduced coagulating power of the blood, the effects of constipation and of emotional stress are more likely to be the factor or factors involved inducing increased uterine flow. He says the curette has lost its vogue since it has been shown that it had a curative effect on only 10 per cent. of five hundred cases of uterine hæmorrhages compiled by Busse.

H. B. Whitehouse (*Lancet*, April 4th, 1914) says, "if the examination of the curetted endometrium is taken in conjunction with the menstrual discharge and care is taken to co-relate the appearance of the endometrium with the period of the sexual cycle, much valuable information may be gained as to the cause of hæmorrhage. This is proved by the examination of repeated scrapings from the same uterus, and it accounts for the fact that in glandular hyperplasis of the endometrium, curettement is only of temporary benefit."

The correctness of these views are being recognized more and more by gynæcologists everywhere, and at the last meeting of the Pathological Section of the Academy Dr. B. P. Watson showed interesting lantern slides which confirm these researches. My own clinical experience and the study of the routine scrapings from the uterus done at St. Michael's and Grace Hospital laboratories leads me to endorse the conclusions.

Curettage is one of the most abused operations of surgery. The simplicity of its technique and the general belief in its freedom from danger, have led to its unnecessary use, often with disastrous results. We have known of women dying after a simple curettage and the morbidity resulting from it is not easy to estimate. Although as a rule it is not a grave operation it should not be undertaken without all due care; as a matter of fact, it is seldom called for unless in conjunction with other operative measures required. Pathological conditions of the endometrium which may be benefitted by curettage are rare; even the fungus or villous forms are rarely cured by it, and these cases generally come to hysterectomy. At or near the menopause the curette is of little service except for diagnostic purposes.

What are we to do then in these cases where no gross pathological lesions are to be discovered? Such are among the most puzzling and perplexing problems with which the general pratitioner and gynæcologist have to deal. These cases occur both before and after the menopause. One safe rule to lay down is that no treatment should be instituted until malignant disease has been absolutely excluded, then palliative measures may be tried. If in spite of all treatment the hæmorrhages continue as they sometimes do and the patient is going down hill, hysterectomy should be performed. In this type of case which is usually uncomplicated and in which the uterus is small, a total extirpation may be done easily and with comparative safety; in fact, the danger from the operation is not so great as the danger of an intercurrent malady attacking an exsanguinated patient. The choice of abdominal or vaginal route will depend upon the size of the vagina and the operator's familiarity with the different techniques. Before undertaking the operation it is assumed that all medicinal treatment has been exhausted.

The treatment of each particular case will depend on its careful investigation and it is here that often a general cause may be discovered that may account for the hæmorrhage. Among these may be mentioned heart disease, interfering with the vascular circulation, liver disease interfering with the portal circulation, disease of the kidneys, gout, obesity and various blood conditions. Here the treatment indicated is that required for the general condition. I would call attention to the importance of recognizing syphilis as a causative factor in some cases of hæmorrhage. It is one of the possibilities seldom thought of and the importance and necessity of using the Wassermann test is apparent. I have seen two such cases where no other evidence of the syphilitic nature of the trouble was present.

In some cases disturbances attributable to the ductless glands may be a cause of the hæmorrhage. E. Sehrt (*Münchener Medizinische Wochenschrift*, February 10th, 1914) says, "the connexion between the thyroid and the ovaries seems to be particularly close and the thyroid may be responsible for conditions in the ovaries which entail bleeding in the uterus. We understand this a little better since we have learned the characteristic behaviour of the blood when the thyroid is functioning to excess or not enough. With hyperfunction the blood is abnormally slow in coagulating. With deficient function it coagulates abnormally fast." Sehrt found in fifty-six cases of uterine hæmorrhage without discoverable local cause that thirty-eight had all the signs of pronounced hypofunctioning of the thyroid. On this basis he gave thyroid treatment with marked benefit; not only the hæmorrhages but the general health showed a change for the better. Personally I have not seen much benefit from thyroid, ovarian, corpus luteum or pituitary extracts, at or after the menopause.

The best general lines to follow in treatment are rest in bed, hot douches, or saline baths, regulation of the bowels, proper dieting or change of climate and outdoor life. Although ergot has lost its vogue for uterine hæmorrhage, I have found Pil. Ergotin of great value about the time of the menopause; it seems to correct vasomotor disturbances, and besides lessening slight hæmorrhage has a most beneficial effect upon the hot flushes, headaches, palpitation of the heart and nervous and mental depression from which these women so often suffer. Roentgen rays have been advocated by some men; the effect, however, is said to be due to the influence upon the ovary rather than on the uterus directly. Radium has been tried and some success has been reported but it is condemned in other quarters. With these two latter methods I have had no experience. In view of the success which has been attained by blood transfusion in various hæmorrhages, it is possible that this treatment may be used in the future with advantage in severe cases. The recent simplification of technique makes this method more available.

SUMMARY. 1. The menopause is probably induced by retrogressive changes in the ovary.

2. The menopause is *subsidence* of the flow of blood,—an *increase* in the flow is always pathological.

3. The menopause may occur during a period of thirty years or more.

4. A local examination should always be made where hæmorrhage occurs near the menopause.

5. Professional and public education regarding the early symptoms of cancer of the uterus is necessary.

6. In severe cases of uterine hæmorrhage which have resisted all medicinal treatment and where the patient is becoming progressively worse hysterectomy is indicated.

7. There seems to be no connexion between hyperplasia and hypertrophy of the endometrium and hæmorrhage from the uterus.

8. At or near the menopause the curette is of little service except for diagnostic purposes.

9. No palliative measures should be tried till malignant disease is excluded.

10. General conditions may be the cause of hæmorrhage, and syphilis should not be overlooked.

11. Organotherapy is of little value in hæmorrhage at or after the menopause.

12. Blood transfusion is a possibility in treatment of severe cases.

SOME SEQUELÆ OF ANTITYPHOID INOCULATION

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SINCE the declaration of war an enormous number of men have been inoculated against typhoid fever, a number infinitely in excess of anything hitherto attempted. With modern methods of military sanitation it is to be hoped that no very extensive outbreak of enteric will occur, either in the troops at the front, or in those collected in training camps. Nevertheless, from bitter experience in the past we may be certain that considerable numbers will be exposed to the onslaught of the *Bacillus typhosus*, and undoubtedly results of great theoretical and practical interest regarding the immunizing power of antityphoid inoculation will be forthcoming in due course.

In the meantime we are confronted with a series of phenomena which merit, and which are receiving, a considerable amount of attention, i.e. the effects produced by prophylactic inoculation. This subject was discussed in a paper by Sir William Osler in the *British Medical Journal*, November 28th, 1914, in which he quoted a number of results which I sent him. In the present communication I propose to amplify these, and to consider some further cases which have come under my notice. In investigations of this nature it is essential to have large numbers of cases at one's disposal, and I have been fortunate in having the opportunity of observing the effects of prophylactic inoculation on the eighteen thousand men composing the North Midland Division of the Territorial Force.

Violence of the Reaction. There can be no question of the fact that the reaction to a prophylactic dose in the doses at present employed, is much more pronounced than to a staphylococcal or streptococcal vaccine. In many cases, doubtless, the reaction is a slight and insignificant affair, involving merely some transient discomfort. In a considerable number of instances, however, the symptoms are sufficiently severe to deserve more serious consideration. The vaccine used was that prepared by the Royal Army Medical College, Grosvenor Road, but in some of the later cases that supplied by the Inoculation Department of St. Mary's Hospital was employed. In these cases the resulting reaction was much less marked. The reaction produced was local and general.

The *local reaction* consists of a varying degree of pain, redness, and swelling at the seat of injection. In the majority of cases the reaction is sufficiently marked to prevent the arm being used for at least twenty-four hours. In some cases it assumes the character of a true inflammation, which spreads downwards as far as the elbow, the whole upper arm showing a brawny induration, which may take more than a week to subside. In the case of one officer, in whom the reaction was of an unusually violent character, when the swelling subsided a thickened, cord-like structure could be felt along the line of the brachial artery, extending up into the axilla and downwards for about two inches below the lower border of the pectoralis major. This thickening gradually passed off, but remained perceptible for three or four weeks. Thrombosis had evidently taken place in one of the veins accompanying the brachial artery. In no case did abscess formation follow inoculation.

The *general reaction* manifests itself by constitutional symptoms, such as general malaise, headache, pains in the back, disinclination for exertion, and perhaps a slight elevation of temperature. These symptoms are well summed up by Osler in the term "inoculation fever." The general reaction varies in intensity even more than the local, and with our present ignorance of the fundamental conditions on which the various reactions comprised under the term immunity depend, it is in most cases impossible to explain why one man should escape with a mere trace of indisposition, whilst another should be prostrated with the severest constitutional symptoms. Probably much depends on the powers of the tissues—using the term in the widest sense—to produce disintegration of the bacilli, with accompanying liberation of endotoxins, tissues which are hypersensitive or "allergic" producing a much greater disintegration, with accompanying toxæmic symptoms.

There are certain factors which may have some influence upon the intensity of the reaction.

Exercise appears to aggravate the symptoms. It was found that when the men of a battalion had to walk two miles after inoculation they showed somewhat marked constitutional symptoms. Part of the battalion was inoculated at their own headquarters, and the reaction in the men was distinctly milder in type. Officers who insisted on doing a full day's work on the following day suffered more severely than those less heroic souls who forsook the parade ground for the shelter of their billets. Whenever possible it should be made the rule that no work be done on the day of inoculation, or on the day following.

Alcohol. It is generally assumed that the consumption of alcohol exerts an injurious influence on the local reaction, considerably intensifying it, and it has been customary to advise the men to abstain from alcohol for forty-eight hours. In the cases coming under our observation we have found little evidence in support of this view. In the great majority of cases alcohol certainly did not intensify the symptoms. Four men, whose cases I examined personally, drank large quantities of beer immediately after inoculation; all four escaped with the slightest possible local and general reactions, whereas many of the other men inoculated at the same time presented quite marked symptoms. One officer, of markedly temperate habits, consumed a large quantity of alcohol for experimental purposes shortly after his second inoculation. The first dose produced the usual local and general reaction, but the second produced no reaction of any kind whatever. Lest it should be urged that the immunizing power of the vaccine was in some way interfered with by the alcohol, it may be stated that the blood of this case showed a well-marked Widal reaction a fortnight after the second inoculation. Thus alcohol consumed soon after inoculation appears to produce no injurious effect; indeed it seems, if anything, to lessen the reaction. Colonel Beevor, assistant director of medical services, North Midland Division, tells me that his own experience in India was very similar, so much so indeed that he used to advise his men to have a good glass of beer immediately after inoculation.

When, however, an interval of a couple of days has been allowed to elapse between inoculation and drinking, the case is different. A couple of officers did not touch alcohol until forty-eight hours after inoculation; each then had a glass of lager beer. The effect was astonishing. In about three minutes the arm began to ache, and on examination was found to be inflamed, swollen, hot, and very tender, although prior to inoculation almost all the signs of local reaction had disappeared. The condition of inflammation lasted for two or three hours. The suddenness of the change was the most striking feature, and the causal connexion was absolutely undoubted. I have seen several other cases of a similar nature, in some of which the alcohol was in the form of whisky and claret.

Previous attack. On *a priori* grounds one would expect the reaction to be slighter in those cases who had had a previous attack of typhoid. Only two such cases came under my notice, but in both the reaction was extremely marked. It may be that some degree of hypersensitiveness existed. *Age* did not affect the reaction to any appreciable extent.

Pathological phenomena developing after inoculation. Hitherto only normal reactions have been considered, or reactions differing from the normal merely in their varying degrees of intensity. In some cases, however, there supervened definite pathological phenomena of considerable importance.

Intestinal symptoms. In quite a number of cases definite evidence was observed of a considerable increase of intestinal activity. This may be due to an inflammatory condition of the intestinal mucosa set up by the inoculation, or it is possible that the activity of certain members of the intestinal flora may be increased. In many cases diarrhœa and intestinal pain were complained of, and in such a case as the following it was evident that an abnormal amount of fermentation was set up. An officer (R.A.M.C.), who had never previously suffered from enteric, was inoculated for the first time. The same night he began to experience considerable abdominal discomfort, amounting at times to definite pain; this feeling was localized, and coincided in distribution almost exactly with the position of the cæcum and the terminal portion of the ileum. During the night he had to go to stool several times, and this looseness of the bowels continued throughout the succeeding day. The motions were semi-fluid, greenish in colour, contained a large amount of mucus and possessed an extraordinarily offensive odour. Evidently some well-marked change had been induced in the intestinal contents by the inoculation. A very similar train of symptoms followed the second injection. The pain was again confined to the region of the cæcum, large quantities of mucus were passed, and the motions were once more extremely offensive.

Such a sequence of events following on both occasions may safely be removed from the realm of coincidence. The endotoxins liberated from the bodies of the typhoid bacilli by the cytolytic action of the tissues seem to have exerted some influence on the mucous membrane of that part of the alimentary canal which is specially affected in typhoid fever, and may possibly have aroused some members of the coli-typhoid group to increased activity. The importance of this case is that it provides a connecting link with the two cases of appendicitis about to be described.

Appendicitis. The first case was that of a young man who had had two previous attacks of pain in the region of the appendix, the last attack being eight months previously. He was inoculated for the first time on September 18th, and at mid-day on the 19th he developed pain in the abdomen, settling into the appendix region. On September 21st, he was admitted into hospital, operated on at once, and a perforated appendix bathed in pus was discovered.

The second case also developed appendicular pain within twenty-four hours of inoculation, was operated on as soon as the diagnosis was definitely established, and an acutely inflamed appendix with periappendicular abscess was again found. Both cases made a good recovery.

The first case might have been regarded as a coincidence. The occurrence of the two cases, although extremely suggestive, might have received a similar explanation, owing to the lack of any apparent direct connexion between inoculation and appendicitis. The above-mentioned case of intestinal catarrh, however, forms an important connecting link with these cases of appendicitis. If intestinal catarrah and fermentation can be set up by typhoid inoculation, there is no reason why in the appendix itself there should not be catarrah of the highly lymphoid mucous membrane, together with heightened activity of the bacterial flora within its lumen, a combination well calculated to precipitate an attack of acute inflammation, especially in an appendix already not sound.

Typhoid. There seems little doubt that in the following case inoculation bore a close causal relationship to an attack of typhoid fever.

The patient, a young man, complained on October 2nd of feeling seedy, but was able to remain on duty. During the next fortnight he felt by no means well. He was inoculated on October 16th. He had a somewhat violent reaction, and became rapidly worse. On October 19th and 20th he had diarrhœa, for which he saw the regimental medical officer. On the 23rd he had a temperature of 101·5°, rose spots, slight abdominal tenderness, and a large spleen; the diarrhœa was replaced by constipation. The case developed into a typical one of typhoid fever, and was removed to a general hospital.

From the sequence of events it is almost certain that at the time of inoculation the patient already had typhoid bacilli in his bowel or gall-bladder, that the large prophylactic dose—so much larger than a therapeutic dose, and intended for a healthy individual

—lowered the opsonic index to the typhoid bacillus, and that an attack of the disease was thus precipitated. A somewhat similar case is reported in the *British Medical Journal,* December 26th, 1914. On can well imagine what capital the "antis" would make out of such a case as this, and with what ingenious misrepresentations they would report it.

Jaundice. In four cases jaundice developed a few days after inoculation. There can be little doubt that the jaundice was catarrhal in type, and caused by obstruction to the outflow of bile from swelling of the intestinal mucous membrane, the effect of inoculation. In every case the patient became noticeably lethargic. The usual signs of jaundice, such as slow pulse and clay-coloured stools, were also present. Recovery in each case was rapid and complete.

Pneumonia. In two cases inoculation was closely followed by an attack of pneumonia.

CASE 1. A healthy young man was inoculated for the first time at 9 a.m. At mid-day he had a rigor, and by the evening felt very ill, and complained of pain in the right side. Two days later he was admitted to hospital, and was found to be suffering from a typical lobar pneumonia, involving the whole of the right lower lobe. The sputum contained numbers of pneumoccoci. On the seventh day of the illness the temperature fell by crisis and the patient made a good recovery.

CASE 2 was similar in character, except that the onset was not quite so rapid. The patient was inoculated for the second time, felt very seedy next day, and three days later had a typical lobar pneumonia. Again the sputum contained numerous pneumococci.

These cases of pneumococcal infection were evidently precipitated by the inoculation, but without doubt the causal organisms were lurking in readiness to make an attack. Had the patients not been inoculated, some such depressing influence as a chill would have got the blame, instead of the vaccine.

Skin rashes. Three cases of severe urticaria came under my notice. In one of these the colour was of a remarkably vivid hue; it was as if the patient had been steeped in some aniline dye, such as eosine. In no case did the condition last for more than forty-eight hours. None of the cases showed any rise of temperature.

In some cases the inoculation appears to have picked out a previous weak spot. Thus a sergeant, who had rheumatism in his right knee in August, when inoculated at the end of October developed severe pain in that knee. In the case of an officer conjunctivitis occurred on both occasions in one eye which had previously been the seat of some conjunctival trouble. Another man, who had sprained his foot some time previously, had considerable pain in it after inoculation.

Conclusions

In the great majority of cases inoculation is a harmless procedure, involving at the most a certain degree of temporary discomfort, and those constitutional symptoms comprised under the term "inoculation fever."

In a few cases the sequelæ are of a more serious character, and in some instances inoculation may be followed by such conditions as pneumonia, appendicitis, and severe gastro-intestinal catarrh.

In so large a series of cases it was only to be expected that some unforseen phenomena should develop. If eighteen thousand men are taken out for a march, and one of them develops pneumonia, even should the patient unfortunately die, it does not incontestably prove that marching is an occupation most dangerous and injurious to the private soldier, and one which should on no account be indulged in. Rather does it prove that if sufficiently large numbers of men be considered, in a small percentage such organisms as the pneumococcus will be found lurking, and any depressing influence, such as a slight chill or inoculation, may precipitate an attack of a disease which was in any case imminent. It is the duty of the scientific worker, "the picker up of learning's crumbs," to record all the results which he obtains, whether they be favourable to his initial thesis or not, yet he cannot but lodge a protest when he finds certain of his statements, divorced from their context, paraded before the would-be recruit as an awful and solemn warning against the loathsome and pernicious practice of inoculation, by a small party of men and women whose fanaticism is untinctured with commonsense, and who, for reasons incomprehensible to the ordinary mind, appear bitterly to resent the idea that our soldiers should be as efficiently as possible protected against infectious disease.

JUVENILE DELINQUENCY*

By Gordon S. Mundie, B.A., M.D.

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THE aim of a court of justice should be to place the responsibility of any crime committed on the right person, and then to decide how far this responsibility should be borne by the person accused. This, however, is not our modern way of dealing with crime, in fact our method of dealing with criminalism is a hit-or-miss one. According to law every man is innocent until proved guilty (although even this statement is very much twisted in our courts of law), but the fact I wish to bring forward, is that every wrong-doer should be held irreponsible for any crime until proved responsible. In order to show that we do not achieve the object aimed at, i.e., that when a person is committed to jail or penitentiary he is returned to society, after a certain time, a better individual, mentally and physically, and of less danger to the community, we have only to read the reports issued in England. In 1910 out of one hundred and sixty-eight thousand offenders, one hundred and four thousand had been convicted previously; sixty-five thousand of these had been convicted more than twice before and twelve thousand upwards of twenty times. Why this failure of adjustment? Was the prescribed treatment unsuited, or is it impossible to reform some offenders, or was the environment after release the cause? These are the questions which we should try to unravel.

Unfortunately in this country there are no figures such as the above; in fact, no attempt is made to establish the connexion between the crime committed by the accused person and his mental make-up. Crime, like all conduct, is an attribute of mental life and this being so, in order to get at the cause of crime we must study the mental life of the criminal. Very little has been done in developing this science, but what has been done has clearly shown that most criminals are physically and mentally inferior. Lombroso and his school have attempted to prove that there is a definite criminal type which is inherited generation after generation, but the work of modern criminologists and psychologists has shown the error of this theory. The studies of criminalism of the present day aim at the development of a science of adjustment of human relationships. The solution of the problem involves adjustment between social possibilities and individual tendencies. For rectification of anti-social conduct there must be self-developed or environmental control—in either case an adjustment. Our courts of law do not take any cognizance of any intrinsic conditions of the mind and body which might predispose towards delinquency. As shown by the English statistics, the offender is often returned to society no better equipped to avoid misconduct. The object of every court of law should be to develop a science showing how best to deal with the criminal. This would mean the appointment of an expert psychologist and physician, or a physician with a psychological training, who would examine any accused person referred to him and gather statistics on this subject. The causes of misconduct may be found in outer influences, past or present, in physical make-up, in mental defects or aberrations; or in mental habits, imageries, conflicts and repressions. In the last few years tests designed to determine the mentality of a person, especially of children, have been greatly improved, and it is along these lines that the greatest advancement has been made. The Binet-Simon tests, with their modifications, and the form boards and other tests, as used by Healy and at Ellis Island, have been of great help in the Juvenile Courts, and in weeding out the mentally defective immigrant.

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* A preliminary report on the examination of the boys sent from the Juvenile Court, Montreal, to the Shawbridge Training School.

In order to determine, if possible, what percentage of the children sentenced by the Juvenile Court, Montreal, were mentally defective, I obtained permission to examine the boys sent to the Boys' Farm and Training School, Shawbridge. There is no doctor attached to the Juvenile Court, Montreal, and no examination is made of the children's mentality, but they are simply sentenced for a term of years at Shawbridge by the judge. The boys were examined with the Binet-Simon tests and one of Healy's form boards along with a thorough physical examination, including where possible an examination of the nose, throat and ear, and a note by the superintendent on the boy's character and family history. I am indebted to Dr. Dorval, of Montreal, for the examinations of the nose, throat, and ear.

At Shawbridge all the eighty-one boys were examined; in addition to these, I have examined, in an unofficial capacity, five boys and one girl from the Juvenile Court, making in all eighty-seven children, ranging in age from nine to nineteen years. The results of the examination were quite in accord with the findings of Goddard and others in the United States. Forty-two out of the eighty-seven children were three years or more retarded, or in other words were mentally defective, a percentage of 48·27; twenty were normal; twenty-two were from one to three years retarded, and in three cases the examination was unsatisfactory owing to nervousness of the child. Every child was examined individually and in quiet surroundings. It is important, of course, in using these tests to make the child perfectly at ease and to have no preconceived ideas of his mentality. Physically the boys when they arrived at the Home were, as a rule, in poor condition, but as most of them had been there for some months they were in very fair condition when examined. According to Dr. Dorval a large proportion of them were suffering from enlarged and diseased tonsils and adenoids, rhinitis, pharyngitis and ear disease. A large number also had bad teeth. The history, especially the family history, of each child could not be obtained fully, and all I could rely on in this regard was what the superintendent could tell me. This is most to be regretted, and it should be arranged that a copy of the probation officer's report be sent with every boy sentenced to the Training School.

An important point in the examination of these eighty-seven children is that not one of them was an epileptic; Healy, out of a thousand children at the Juvenile Court, Chicago, found that 7 per cent. were epileptic, so that it is remarkable that not one of my cases had epilepsy. Several of them had a history of convulsions in early infancy, but none of them at present suffer from them. Of the fifty-eight boys who had reached the age of puberty, in only five was there a history of masturbation or sexual perversion, a percentage of 8·62. Twenty-seven boys were of the Jewish nationality and fourteen of them were mentally defective. The Jewish boys were mainly sons of immigrants and their delinquency can possibly be traced to the fact that they learn the English language more quickly than their parents, which leads to lack of parental control; and along with poor environment and lack of playgrounds, they soon drift into bad company which eventually leads to delinquency. This problem of the children of immigrants is a most interesting and important one which must soon be seriously considered by the State.

The following notes on some of the boys will perhaps give a better idea of their examination than I could explain.

No. 50. Canadian born boy sentenced for five years for theft. His father is dead and his mother has tuberculosis. He is very deaf from chronic middle ear disease, has enlarged tonsils and adenoids and a naso-pharyngeal catarrh. His age is fifteen and his mental age nine. He is a harmless lad with an amiable disposition but with no judgement or will power, and therefore should be kept in an institution all his life.

No. 100. This boy was sentenced for four years for theft of tobacco. His father, a French-Canadian, is alive; his mother, a coloured woman, is also alive but a drunkard. His home is a wretched one and all the rest of the family are criminals. This is his second or third time in a reformatory. He is doing well but is a sexual pervert. His mental age is apparently normal, although the examination was not altogether satisfactory. He has diseased tonsils and hypertrophy of the middle turbinate bone.

No. 114. A Jewish boy born in Bucharest. His father is a cataleptic, lazy, and likes to exhibit his catalepsy; his mother is a highly strung, nervous woman; one of his brothers is in the penitentiary; another brother is with him at Shawbridge, and is two and a half years mentally retarded; a sister, aged sixteen, ran away from home and was found in Toronto masquerading in boy's clothes. When this boy came to Shawbridge he was suffering from syphilis, heart disease, hæmorrhoids and varicose veins. After six weeks in bed he began to improve and has continued to do so. His age is seventeen and his mental age is fourteen. He should always be under supervision.

No. 126. A Jew, sentenced for three years for shop-breaking and stealing. His father and mother are dead. His age is sixteen and his mental age ten and a half. He has no judgement nor will power whatever and is a masturbator. He should be in an institution all his life.

No. 130. A son of Irish parents. He came to Shawbridge with one of the worst characters that could be imagined, and all the court officials predicted that nothing could be done with him. He has given no trouble whatever, and is one of the best boys. He was suffering from chronic constipation, diseased tonsils, and chronic rhinitis. With the improvement in his physical make-up his mentality has also improved. His mother is a small, nervous woman, while his father is a big Irishman. His age is sixteen, while he is mentally nine and half years old, but I believe that as he improves physically he will grow mentally and should eventually make good. A brother of his, whom I examined, was six and half years retarded mentally but he also was badly nourished and was suffering from chorea.

No. 137. A boy born in Canada of English parents. His father and mother are both dead but he has a step-mother. He is what the superintendent calls "a neglected boy." He is nineteen years old but mentally only eleven and a half years. He is one of these simple, confiding types of children, of the moron class. He needs institutional surroundings all his life. He makes a good farm worker.

No. 141. An English boy, sentenced for three years for vagrancy. Father and mother are both dead. Has good brothers and sisters. His age is sixteen, but mentally only eight years; he is a medium grade imbecile. When asked to do the "Mare and Foal" picture puzzle test he placed the blocks over the holes —not getting one in properly—and was quite satisfied that he had done it correctly. He is very affectionate but a masturbator. He should be in an institution all his life.

No. 169. A son of immigrant Jews. This boy is about four feet six inches tall, a bright, cheerful chap, a born leader. He was one of the best boy burglars in Montreal. His age is nine and mentally seven years. He soon got out of parental control and roaming the streets got into trouble. This boy, on account of his cleverness, will one day, I am afraid, have to be sent to the penitentiary.

No. 172. This is the only girl from the Juvenile Court that I have examined. She is a nice English girl, age eleven and a half years with a mental age of eight and a half years. She is a kleptomaniac, walks the streets and sleeps under stairs, away from home at night. She had very diseased tonsils and adenoids. She is the only child and her parents, especially the mother, who is a very nervous woman, have no idea how to manage her. Under proper care, she should grow up a fine woman, but with her present environment, I am afraid, will develop into a professional street walker.

Every individual in his development from infancy to maturity repeats the history of his race. This is a history of steady and progressive climbing upward from the condition of primeval man up through savagery, next merging into barbarism, then into chivalry and finally into modernism. Each child lives through these stages of racial development and the different exploits he enters into are simply manifestations of this development. If we realize this it will help us to find the solution for many cases of delinquency which may puzzle us.

From a physical standpoint, loss or lack of nerve control is an important cause of delinquency. This loss or lack of nerve control may be caused by nerve initation, gross failure of development of the nervous system, or lack of development of the higher centres. Every physical defect is a source of nerve initation but the most common ones are phimosis, diseased adenoids and tonsils, malnutrition, eye strain, and diseased or impacted teeth.

The problem of the mentally defective in Canada and their relation with delinquency must soon be studied and a solution found, because to-day the feebleminded children who are living in this country are costing the government thousands of dollars. It must not be forgotten that every imbecile, especially the high grade imbecile, is a potential criminal. The problem should be attacked in several ways. First, the government should see that every immigrant, man, woman and child, is given a thorough mental examination, as is done at Ellis Island, and every feebleminded person sent back to the country from which he came. Secondly, our public schools should be used as clearing houses for the mentally defective. In order to do this there must be compulsory education from the Atlantic to the Pacific, and efficient medical inspection of the school children. I cannot speak for other cities, but I do know that the medical inspection of school children in Montreal is not efficient. The object of the medical school inspector in Montreal is simply to diagnose diseases of a contagious nature, which can usually be done as well by the principal of the school. No thorough examination is made of the nose, throat, ears, eyes, heart, or lungs. No attempt is made to find out why a certain child is backward in his studies. As to mental tests, I am afraid, the ordinary medical school inspector has not yet learned their importance. This would seem to involve considerable labour, but after all the children had been once examined it would be an easy matter to examine every new pupil. Until this is done and proper institutions are provided for the care of the feebleminded, the State will continue to erect huge penitentiaries and maintain them at an enormous cost.

Case Reports

FŒTUS IN FŒTU

AN Assyrian living at St. Mary's, N.B., called me to see his daughter Rosie, whose age was eight years and who was very small of stature. The father's complaint when asking professional attention for his child was that "Rosie had a big belly." The child was apparently in good health with a normal temperature and but little discomfort from the distended abdomen, which made her appear as a miniature pregnant woman.

During the years previous I had seen the child with minor troubles but had never been suspicious of any abnormal condition in the abdomen, but now I found a greatly distended abdomen with a hard mass lying more to the left than in the median line, apparently floating in fluid.

At the Victoria Hospital, Fredericton, on December 9th, 1912, while Dr. McGrath gave the anæsthetic, I made an incision through the skin and adipose tissue to the left of the median line and horizontal to it, extending about two inches towards the crest of the ilium. After exposing the sheath of the external oblique muscle and cutting, the muscles were pulled apart and the peritoneum opened, exposing a cystic mass. The skin, adipose tissue, and muscular sheath were again incised for a distance of two inches in a perpendicular line running from the centre of the first incision downwards, so that the muscles could be still farther separated for a distance of two inches or more; after incising the sheath the peritoneum was cut in the same line, thus giving a good opening into the obdomen. The cyst was tapped, allowing the escape of a quantity of clear fluid which looked like ascitic fluid. The mass in its sac was drawn out and found to be attached to the left broad ligament which was tied off disengaging the whole mass within its sac. The surgical wound was then repaired, stitching with iodized catgut the peritoneum and sheath of muscles; the skin and adipose tissue were brought together with silk-worm gut; no drainage was used.

The specimen was sent to the laboratory before I had finished the operation, where Dr. Holden, the pathologist, discovered it to be Rosie's twin, which had been engrafted during embryological development within her abdominal cavity before its closure. The mass without fluid and sac was as large as two good-sized fists placed side by side. The body of the fœtus was perfectly shaped. The genitals, those of a female, were as perfect as in a newborn child. The legs and arms were perfectly formed, but made one think of an *x*-ray plate, being perfect in shape but wanting in substance. The skull-cap with hair was in perfect form; there was brain tissue under it. The face was not formed perfectly.

The little patient made an uneventful recovery and in two weeks was out of the hospital; her health has since that time continued good.

How delightful it is to go back to our embryological teaching and realize that the individual begins from one cell—the female ovum which when impregnated absorbes the male sperm. This cell then segmenting into other cells which assemble themselves into three rows of cells, each row designated by the great law of nature to form a part of the body; one row the structural part, bones, muscles, etc., another row the internal organs, the third row the nervous system and special senses. Then, as development *in utero* progresses, these layers bend upon themselves to form the body cavity. The rest is easily explained; another ovum was impregnated when Rosie was conceived, and became enclosed in her abdominal cavity where it grew as her tissues grew, growing in the same way that a skin graft would grow.

Fredericton, N.B. HARRY H. MCNALLY, M.D., C.M.

DURING the month of March 522 cases of measles were reported in Winnipeg, eight of which were fatal. The other cases of contagious diseases reported were, typhoid fever, 2; smallpox, 7; chicken-pox, 36; scarlet fever, 20; whooping cough, 9; mumps, 4; diphtheria, 36; erysipelas, 3; tuberculosis, 28; the deaths recorded were whooping cough, 1; diphtheria, 5; erysipelas, 2; tuberculosis, 17.

Editorial

THE POSTPONEMENT OF THE MEETING

THE forty-eighth annual meeting of the Association which was to have taken place in Vancouver, July 6, 7, 8, and 9, has been officially postponed. As announced in these columns last month, the Committee of Arrangements in Vancouver reluctantly advised the Executive to take this action, as they had then become convinced that the prospects did not justify the holding of a meeting this summer. This conclusion was not, however, arrived at without every effort having been made to arrange a successful meeting, or without careful and deliberate consideration. Nearly every medical man in Canada had been invited to be present and contribute a paper. Most discouraging were the replies, particularly from Eastern Canada. Practically no one, except a few giving papers, consented to attend, and many who, earlier in the year, had signified their willingness to contribute, had since sent regrets. The daily cancellation of promises was particularly discouraging. Within four months of the announced date of the meeting the prospective papers amounted to less than a third of the number necessary for a satisfactory programme, and more than half of these were from the United States. Some prominent Americans and one Australian, Dr. Rennie, had consented to give Addresses, but the Committee felt it would not be in the best interests of the Association to bring these guests to a meeting the attendance at which would not be representative of Canada, but would consist almost entirely of local men. Furthermore, many of the most prominent supporters of the Association throughout the country had written either suggesting or urging postponement, and the decision of the British

Medical Association not to hold its regular meeting this year also had some influence and furnished a sort of precedent. Nevertheless, in spite of the cheerless prospects, the Vancouver committee offered to proceed with the preparations, if in the opinion of the Executive the meeting ought to take place this summer.

The following is the resolution of the Committee of Arrangements: "That in the opinion of this Committee a meeting of tho Canadian Medical Association in July 1915 would not be a success; that such a meeting should be postponed until the termination of the War; that at a subsequent suitable time the meeting be held in Vancouver with the present local executive organization in force; and that the Local Secretary be instructed to communicate the same to the General Executive." This resolution was laid before the members of the Finance Committee, which is a body composed of seven men, elected from and by the members of the Executive Council, and charged with the carrying on of the business of the Association in the intervals between successive meetings; and at a meeting held in Montreal on April 6th, it was decided by six votes to one, that the Vancouver Committee should be officially authorized to postpone the meeting for the period of this year, and that this decision be laid by correspondence before the Executive Council for confirmation. This was accordingly done. At the present writing, of the thirty-four members of the Council, twenty-four have signified their approval of the postponement, and only one has disapproved. Three have protested against the assumption on the part of the Finance Committee that it had power to act officially for the Council in so important and unprecedented a question. The difficulties, however, in the way of getting together a representative quorum of the Executive Council at the present time are unsurmountable. The question was one to be decided with as little delay as possible, and the Finance Committee was convinced, from previous correspondence and discussion, that the Association as a whole would be prepared for this advice on the part of the Committee of Arrangements, and would agree that under existing circumstances, the attempt to hold the annual meeting should be abandoned.

As to the third clause of the Vancouver resolution, the Finance Committee was of the opinion that the question of the time and place of holding the postponed meeting was one to be arranged later by correspondence with the Executive Council, so soon as the unsettled conditions in this country improved to such an extent as to make possible the holding of a successful representative meeting. Such an occasion might possibly arise before the official termination of the War. It was, however, recommended that such meeting be held in Vancouver with the present Committee of Arrangements in office, unless the interests of the Association, at the time, should imperatively demand that the meeting take place in some city more centrally situated.

It is indeed unfortunate that after forty-seven years of successful gatherings there should be this break in the continuity. All must sympathize with our Vancouver hosts in the frustration of their plans. This summer had long been looked forward to as the ideal opportunity for a meeting on the Pacific Coast; instead, it finds many of us in Europe on the grimmest of business, and the rest too poor or too busy to leave home.

THE ASSOCIATION'S AFFAIRS

WITH our highest social and political interests in the balance, each one of us has one supreme duty, to take his part directly or indirectly in the War, and do what in him lies towards the consummation of an honourable and lasting peace. But this preoccupation should not make us indifferent to the interests which were of importance a year ago. All social organizations have felt the unsettling effects of the great struggle, and the Canadian Medical Association is no exception. For the first forty-three years of its existence the Association was little more than an annual gathering of a hundred or more medical men, at which those who attended paid a small fee. With its surplus funds it issued occasional volumes of Transactions. It was not, however, without influence both within and outside the profession, and it succeeded in bringing about some important medico-political reforms. In 1910 the Association was re-organized, membership was put on a permanent basis, and the foundations laid for a thorough and effective organization, capable of embracing all the provincial and local societies, and through them the entire profession of the country, in one corporate whole. After the establishment of the JOURNAL good progress was made. The provincial associations were affiliated, and by the end of 1913 the membership had passed the fifteen hundred mark. Financially, however, the income of the Association even in that year did not quite balance the expenditure, and the disastrous year of 1914 ended with a serious addition to the deficit, the total revenue being little over seven thousand dollars, nearly eight hundred less than the year before. The unlooked for falling off in membership, to which this was due, is to be attributed to the war conditions and, in a lesser degree, to the financial stringency preceding the outbreak, and to the relatively smaller attendance at the annual meeting.

Furthermore, the difficulties of the Association are administrative as well as financial. Since the autumn the Editor's time has been completely occupied with military duties. The absence of the usual contributions of his masterly pen has been noted by many. At present Captain Macphail is on his way to the front with No. 6 Field Ambulance. Our best wishes go with him and we trust that it may not be long before the JOURNAL will again enjoy the advantages of his guiding hand. Furthermore, the Assistant Editor and Secretary-Treasurer has also joined the colours and is on the staff of No. 3 General Hospital (McGill), which is now ready to be sent off. Excellent provision has, however, been made by the Finance Committee to ensure that the work of the Association shall be carried on efficiently during the absence of these officers. The editing of the JOURNAL will be in the hands of an editorial board and will be supervised by Dr. G. G. Campbell, who was formerly editor of the *Montreal Medical Journal*, and we were fortunate enough to obtain the services of Dr. J. W. Scane, the Medical Registrar of McGill, who has kindly consented to act as Honorary Secretary-Treasurer. Two Montreal members of the Finance Committee, Colonel Birkett and Captain Turner, are also leaving, and a Sub-committee, as provided for in the By-laws, has been appointed.

The financial difficulty has been more or less satisfactorily met by providing that the work of all officers of the Association shall be done this year gratuitously. By this means, and by transferring all editorial business to the Secretary-Treasurer's office, economies have been effected which should result in a saving of some twelve hundred dollars. It was hoped that thus the deficit carried over from last year would be provided for. The postponement of the annual meeting, however, has now further embarrassed the finances, as the Association will be deprived of the usual revenue from that source. Also it will certainly be even harder this year than last to collect outstanding dues. The Finance Committee may, therefore, be reluctantly compelled to appeal to the friends who have the interests of the Association at heart, for funds to tide it over the critical period of the War. Another, no less serious, effect of the cancellation of the meeting will be to deprive the JOURNAL of its main source of original articles. We must therefore crave our readers' indulgence if scarcity of material should possibly result in any lowering of the high standard hitherto maintained.

To overcome these various difficulties the Association imperatively needs the loyal support of all its members. They can help in various ways: First by paying their dues. In this connexion, those who are leaving the country on military service and who cannot conveniently pay their subscription, would confer a favour by notifying the Secretary if they desire temporarily to leave their membership in abeyance, so that the Association may be spared the expense of continuing to send the JOURNAL to their home addresses. Secondly, members may help by interesting others in the Association and its aims, and thus obtain new members. Further, the JOURNAL will be much benefitted, and the anxieties of the editorial board lightened, by the contribution not only of original papers, but also of editorial material, reviews of books, items of medical interest from all parts of the country, and extracts from letters of medical friends serving in the War. In short, with the support which its officers feel it has every right to expect, the Association and its JOURNAL, with which its hopes of future growth are linked, will emerge from this world-wide crisis, if not unscathed, at least unmaimed.

THE NEW BRITISH PHARMACOPEIA

THE new British Pharmacopeia which was issued and became authoritative in Great Britain on the first day of January, contains many important changes with which physicians should make themselves well acquainted. Many of the more inactive drugs have been deleted. About forty new drugs have been made official. Of these new drugs the names by which many hitherto have been known, and which for the most part are patented names, have been changed. Aspirin becomes acetyl salicylic acid; veronal is now barbitone, or malonurea; eucaine lactate is benzamine lactate; heroin hydrochloride is given the name of diamorphine hydrochloride; urotropine becomes hexamine; and trional is altered to methylsulphonal.

Among the more important additions to the Pharmacopeia are adrenalin and its liquor which remains as hitherto a solution of 1 in 1000 parts. Calcium lactate, chloral formamide, glucose, guaiacol and guaiacol carbonate, phenolphthalein, pelletierine tannate, strontium bromide, theobromine sodio-salicylate, and zinc oleo-stearate, appear in the Pharmacopeia for the first time.

Changes have been made in the strength of many of the official preparations, in accordance with the recommendations of the International Committee appointed some years ago to adjust the differences between, and bring into more uniformity of strength, the preparations of the important drugs recognized in the various national Pharmacopeias of Europe and America.

In accomplishing this uniformity many preparations in frequent use in Canada have been weakened, while others have been made stronger. The more important of those reduced in strength are the following:

Dilute nitric acid, dilute phosphoric acid and dilute sulphuric acid, have all been reduced in strength by about one third, so that at the present they represent ten per cent. solutions. Plaster of belladonna now contains one half the alkaloidal strength that it had in the last Pharmacopeia.

Syrup of chloral, syrup of codeine phosphate, and syrup of the iodide of iron are slightly reduced in strength but the reductions are not important. Trinitrin tablets contain now only $\frac{1}{130}$ grain instead of $\frac{1}{100}$. The exact reason for this reduction in strength is not very apparent. Martindale in the last edition of the Extra Pharmacopeia calls attention to the unreliability of many tablet triturates in the market owing to their rapid deterioration on keeping. He insists that only those tablets with a chocolate and fatty basis are accurate and lasting.

Tincture of colchicum is reduced from 1 in 5 to 1 in 10. Tincture of digitalis from 1 in 6 to 1 in 10; while tincture of nux vomica is reduced to exactly one half the strength of the tincture of the Parmacopeia of 1898.

Of the preparations which have been increased in strength the following are the more important. The strength of vinegar of squills is doubled, syrup of chloral, and syrup of codeine phosphate are both increased in strength by twenty per cent. Tincture of aconite is doubled in strength of alkaloid. Tincture of opium is increased in strength by one third. In the Pharmacopeia of 1898 it contained 0·75 per cent. of morphine. In the present Pharmacopeia this is increased to one per cent. The compound tincture of camphor is also slightly increased and contains now 0.05 per cent. of morphine. Tincture of strophanthus is now quadrupled in strength and from containing 1 in 40 now contains 1 in 10.

We understand that all the more important drug houses are conforming to the demands of this new Pharmacopeia but great care must be taken with old stock, especially in the case of those preparations in which the change in strength has been so radical as in tincture of nux vomica and tincture of strophanthus. Unfortunately through an oversight, the Adulteration Act in force at the present mentions the Pharmacopeia of 1898 specifically, and leaves no room for the changes ordered in the edition of 1914, so that according to the reading of our laws the Pharmacopeia of 1898 for this year is nominally official.

By the next session of Parliament, a new bill will probably be passed remedying this oversight, and amending the Adulteration Act in several particulars.

In the meantime it will be wise for physicians prescribing preparations greatly altered in strength to place after the name of the preparations, the edition according to which he has directed the amount of drug to be taken (*e.g.*, B.P. 1914). The passage of such a bill rendering the successive editions of the British Pharmacopeia authoritative throughout Canada at the same date as they become authoritative in Great Britain would be expedited if the various medical and pharmaceutical associations in Canada during the summer would pass resolutions calling for the rectification of the present anomaly.

It may also be stated here that the members of the Committee on the Revision of the Pharmacopeia have on many occasions expressed themselves as open to suggestions from the medical or pharmaceutical associations of our Dominion, of India and the neighbouring colonies, and of Australia.

About one hundred Australian doctors left Melbourne for England on March 22nd, last. They will be followed shortly by a complete hospital unit.

An important announcement was made at a meeting of the New York Pathological Society on April 14th, last, when Dr. H. Plotz, the young bacteriologist of Mount Sinai Hospital, stated that he had discovered the bacillus causing typhus fever. Dr. Plotz, when he succeeded in isolating the bacillus, was working on Brill's disease which has been proved to be identical with typhus.

A committee has been appointed by the Militia Department to make arrangements for the reception and accommodation of soldiers invalided from the front. No definite information is as yet available, The Andrews Home, Montreal, has been converted into a convalescent home, and several people have offered their summer residences for the purpose. Amongst those received are offers from Sir William Mackenzie, Sir Rodolphe Forget, and Mr. D. Lorne McGibbon.

The Kilingbeck Sanitarium for Tuberculosis at Leeds has been in existence less than two years, with accommodation for ninety male patients, and its superintendent is able to make the proud boast that no less than forty-seven of its discharged patients are now serving in the army. It is an encouraging record.

A LIST of additional subscriptions to the Relief Fund for Belgian Physicians and Pharmacists is given on another page of this issue. It is gratifying to note that the amount received by Dr. D. J. Gibb Wishart, the treasurer, is now over nine thousand dollars. The subscriptions received by Dr. Des Voeux, London, up to April 6th, amounted to nine thousand seven hundred, exclusive of the Scottish and Irish funds.

A SYSTEM of circulating country houses is now being organized in Russia. Seventy barges will be equipped with a staff and the necessary medical supplies and will contain comfortable quarters for sick and wounded soldiers. The barges will be towed by steamers to suitable spots on the Dneiper River and its navigable tributaries and will remain there for the periods of time judged expedient.

IN view of the urgent need for physicians, both military and civil, in Russia, it has been decided to interrupt the regular studies of medical students in all the universities. Instead of the regular curriculum special courses will be given in military field surgery and attention to the wounded, in the knowledge of internal complaints common in war, in military field hygiene, and in dealing with epidemics. The regular examinations will be delayed so that the students may give undivided attention to these special subjects.

AN effort was made recently to introduce into the Ontario Legislature a bill which would enable the chiropractors to establish a college and thus give professional standing to the followers of the cult. The proposed bill was discussed briefly in the Private Bills Committee. The Attorney General, however, declared that the government could not consider any such measure until the whole subject of medical education had been investigated by a commission to be appointed for that purpose.

Dr. W. J. Robertson, as chairman of the Ottawa Branch of the Canadian Red Cross, has issued an eloquent appeal to the farmers of the country for contributions to the funds of the Society to provide additional hospital beds and nurses in Great Britain and France. Such an appeal should meet with a ready response, not only for the sake of its object, but because it comes from Professor Robertson, who, as Commissioner of Agriculture, and more recently Chairman of the Royal Commission on Industrial Training and Technical Education, has done so much for the science and practice of agriculture in Canada.

An easy method of sterilizing material for surgical dressings is recommended by Professor Weil, of Lyons, who finds that the temperature at which an iron is used by laundresses is about 150°C. This will cause hydroquinone to melt. To sterilize linen all that is necessary is to dampen it carefully and iron it with a sufficiently hot iron. The iron may be considered sufficiently hot when, on bringing it within a few centimetres of the cheek, a heat too powerful to be borne is felt. The method is carefully explained in the *Lancet*, April 10th, page 767.

The third and fourth units of the Serbian Relief Funds Hospitals left London on April 1st. The third unit, Mrs. St. Clair Stobart's Hospital, is staffed almost entirely by women. The fourth unit, the British Farmers' Hospital, is under the administration of Mr. L. M. Wynch, C.I.E., and has a tent hospital to cover 300 beds, with baths, ice plant, and everything requisite for serum treatment. The third unit will be stationed at Salonika, and the fourth at Skoplje, where there are some 3,000 cases of typhus fever.

The committee formed in Belgium to consider the needs of the doctors and pharmacists has been reinforced and is now known as the Aide et Protection aux Médecins et Pharmaciens sinistrés. The president is Dr. Pechere and the secretary Monsieur Delacre. This body has worked in connexion with the National Relief Fund, and it was through the chairman of this fund, Mr. Herbert Hoover, that the British Committee has been able to distribute medical material in Belgium. In spite of immense difficulties, the Aide et Protection aux Médecins and Pharmaciens sinistrés has succeeded in organizing machinery for ascertaining the names of those in greatest need and for providing systematic relief. Forms have been issued to all doctors and pharmacists in which they are asked to state their position, the position of their families, the loss they have sustained, and the sum needed to tide them over their immediate difficulties. In estimating the validity of the claims made, the committee is assisted by the local medical societies and the government inspectors of pharmacy. In Brussels itself the poorer doctors and pharmacists have been aided by those in better circumstances, and thus the committee has been enabled to distribute the funds at its disposal throughout the country. Now that things are more organized, a sum of money has been forwarded by the London Committee and definite sums will follow from time to time. A generous response has been made from all parts of the Empire, but as the money is expended, more and more contributions will be required.

A WELL-DESERVED honour has been conferred upon Professor Adami in his appointment as Medical Historical Recorder of the Canadian Expeditionary Force, and no better choice could have been made. He has made a special study of the subject and particularly of that model work, the *Medical History of the War of the Rebellion*, a work which has hitherto been unique in the English language. Dr. Adami has been one of the most enthusiastic members of the McGill battalion, and took the earliest opportunity of qualifying in the Army Medical Corps. Joining the staff of No. 3 General Hospital (McGill) as Registrar, he was given the temporary rank of lieutenant-colonel. After his recent appointment he was invited by the War Office to serve on a committee of twelve, under the presidency of the Director-General of Medical Services, charged with the compilation of a medical history of the British Expeditionary Force in this war. It may confidently be expected that the records which they will finally publish will reflect credit upon our profession, and will be looked back to by future generations without the disgust which, let us hope, will be inspired by the barbarous use to which we are putting the mechanical gifts of science. Dr. Adami left about the middle of April to take up his duties in London. His brother officers of the McGill Hospital hope that he may remain officially on their staff as supernumerary. At all events he will have occasion frequently to visit the Canadian military hospitals in the course of his duties.

The following additional subscriptions to the Relief Fund for Belgian Physicians and Pharmacists have been received by the Treasurer:

Dr. Paul Scott, $25.00; Manitoba Executive Committee, 4th remittance, $372.50; Dr. J. E. Elliott, $11.00; Dr. Large, $5.00; Dr. Grant, $3.00; Dr. J. S. Burrie, $10.00; Dr. H. L. Burrie, $5.00; Dr. T. Kearney, $2.00; Dr. J. H. Clements, $3.00; Dr. D. Mcklin, $10.00; Dr. Ford, $10.00; Dr. Rutherford, $10.00; Dr. Deacon, $10.00; Dr. Quinlin, $10.00; Dr. Smith, $10.00; Dr. Montieth, $10.00; Dr. Fraser, $10.00; Dr. Gemmel, $10.00; Drs. Rankin and Cannon, $10.00; Drs. J. A. and L. Robertson, $10.00; Dr. Forester, $10.00; Dr. Maynard, $5.00; Dr. Gregory, $2.00; Dr. Nasmith, $2.00; Dr. Allen, $2.00; Dr. Eassen, $2.00; Dr. McKenzie, $10.00; Dr. Hodge, $10.00; Dr. Armstrong, $10.00; Dr. Burley, $10.00; Mr. Muir, $2.00; Dr. Smith, $10.00; Dr. Hurlburt, $5.00; Dr. Smith, $10.00; Dr. Fraleigh, $10.00; Dr. Stanley, $10.00; Dr. Brown, $10.00; Dr. Knox, $10.00; Dr. Tye, $10.00; Dr. Campbell, $10.00; Dr. King Smith, $6.00; Mr. J. B. Dimmick, $10.00; Mrs.

J. B. Dimmick, $10.00; Dr. Galloway, $3.00; Dr. C. L. Starr, $10.00; Dr. J. Livingstone, $1.00; Dr. E. Boyd, $5.00; Dr. W. E. Gallie, $5.00; Dr. Alan Brown, $5.00; Dr. G. A. Campbell, $5.00; Dr. Roy Smith, $1.00; Dr. Allan Baines. $10.00; Dr. D. McGillivray, $5.00; Dr. Alan Canfield, $5.00; Dr. A. C. Bennett, $2.00; Dr. B. Hannah, $5.00; Dr. Joe Graham, $5.00; Medical Men of Guelph, $60.00; Vancouver Doctors and Druggists, $360.00; Dr. Hubbard, $10.00; Dr. W. F. Clark, $5.00; Dr. F. N. G. Starr, $25.00; Dr. E. A. Robertson, $2.00; Dr. J. T. Gilmour, $15.00; Dr. C. H. Gilmour, $10.00; Dr. Deacon, $1.00; Dr. W. J. Harrington, $5.00; Dr. R. B. Cuthbertson, $5.00; Dr. W. Rogers, $5.00; Dr. Bottomley, $5.00; Dr. Wright, $5.00; Dr. Heaslip, $2.00; Dr. Robson, $2.00; College of Physicians and Surgeons, Manitoba, $1,000.00; College of Physicians and Surgeons, Victoria, B.C., $263.00; From Nova Scotia, per Dr. Lindsay, $487.00; Dr. Park, $10.00; Dr. Hall, $10.00;

THE seventh Pan-American Congress will meet in San Francisco, June 17th-21st inclusive. It assembles pursuant to invitation of the President of the United States issued in accordance with an act of Congress approved March 3rd, 1915. The countries and colonies embraced in the Congress are the Argentine Republic, Bolivia, Brazil, Canada, Colombia, Cuba, Chile, Costa Rica, El Salvador, Ecuador, Guatemala, Honduras, Haiti, Hawaii, Mexico, Martinique, Nicaragua, Panama, Paraguay, Peru, Santo Domingo, United States, Uruguay, Venezuela, British Guiana, Dutch Guiana, French Guiana, Jamaica, Barbadoes, St. Thomas and St. Vincent. The organization of the Congress is perfected in these countries and the majority of them have signified their intention to be represented by duly accredited delegates. The Congress will meet in seven sections, viz., 1, Medicine; 2, Surgery; 3, Obstetrics and Gynæcology; 4, Anatomy; Physiology, Pathology and Bacteriology; 5, Tropical Medicine and General Sanitation; 6, Laryngology, Rhinology and

Otology; 7, Medical Literature. All members of the organized medical profession of the constituent countries are eligible and are invited to become members. The membership fee is $5, and entitles the holder to a complete set of the transactions. Advance registrations are solicited and should be sent with membership fee to the Treasurer, Dr. Henry P. Newman, Timken Building, San Diego, California. The general railroad rate of one fare for the round trip, good for three months, made on account of the Panama-Pacific Exposition at San Francisco, and the California Exposition at San Diego is available for the Pan-American Medical Congress. The Palace Hotel will be headquarters.

The First Pan-American Medical Congress was held in the United States in 1893. Five intervening Congresses have been held in Latin American countries. It now devolves upon the medical profession of the United States to make this, the seventh, the most successful in the series.

The president of the Congress is Charles A. L. Reed, Union Central Building, Cincinnatti. Harry M. Sherman is the chairman of the committee of arrangements and should be addressed at 350 Post Street, San Francisco. The secretary-general is Ramon Guiteras, 80 Madison Avenue, New York. For information concerning hotel accommodation application should be made to Philip Mills Jones, 135 Stockton Street, San Francisco.

Book Reviews

Differential Diagnosis, Volume II. Presented through an Analysis of 317 Cases. By Richard C. Cabot, M.D., Assistant Professor of Clinical Medicine, Harvard Medical School. Octavo of 709 pages, 254 illustrations. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $5.50; half morocco $7.00.

A second edition of the first volume of this work recently appeared. It dealt chiefly with the symptom pain, and with eleven other symptoms. In the present volume some twenty additional symptoms are analyzed and illustrated. The same plan is carried out, a short discussion of the general indications of the symptom being followed by a large number of illustrative case reports, in which the differential diagnosis is carefully analyzed, and the result recorded. Where mistakes have occurred, the reasons for the mistaken diagnosis are fully pointed out, so that the reader is put on his guard against similar pitfalls. It might be supposed that a book consisting almost wholly of classified case reports would make wearisome reading. In these volumes, however, the reports are brief, but in no way stereotyped, and the author has succeeded in producing an admirable work, not only of reference, but one which encourages and well repays serious study. The illustrations are helpful, and a good index supplies necessary cross-references.

Lectures on the Heart: Comprising the Herter Lectures (Baltimore); A Harvey Lecture (New York); and an Address to the Faculty of Medicine of McGill University (Montreal), By Thomas Lewis, M.D., F.R.C.P., D.Sc., Physician, City of London Hospital; Assistant Physician and Lecturer in Cardiac Pathology, University College Hospital, London. New York, Paul B. Hueber, 1915.

The opening pages of the chapter entitled, "The Excitation Wave in the Heart" are given to a clear and concise explanation of the theory of the electric curve recorded by a galvanometer connected to the two ends of a muscle in contraction. The form of the electric curves of the contracting heart muscles is governed by the same laws as is the contraction of a simple strip of somatic muscle.

The author's explanation of the origin and course of the excitation wave of the heart is based on the results obtained from a series of observations on the heart of the dog. His method is to compare simultaneous electrocardiograms, of which the contacts in one are applied to different parts of the heart, and in the other are applied to the right fore-leg and left hind-leg (lead ii). The excitation wave in the ventricle he shows to be dependent upon the distribution of the Purkinje system rather than on the direction of the muscle fibres. This chapter marks an advance in our knowledge of the physiology of the heart.

In the first of the three Herter Lectures he proves by a series of electrocardiographic records that the various altered mechanisms of the heart can be produced experimentally, and in this way illustrates the value of associating clinical with laboratory methods. The second Herter Lecture has for its subject, "The relation of auricular systole to heart sounds and murmurs." The aim of Doctor Lewis in all his work is to make of medicine an exact science. Here he makes use of the microphone, the records of which enable him to establish the important rôle played by the auricle in the production of certain heart sounds and murmurs, and to illustrate graphically the time-relations of such sounds with the different events of the cardiac cycle. He discusses at length the murmurs of mitral stenosis, the time of their occurrence, and their dependence upon difference of intracardiac pressure in auricle and ventricle. The last lecture of the series has to do with "Observations upon dyspnœa with especial reference to acidosis." This chapter deals more particularly with chemical pathology and is based on the work of the author in collaboration with Barcroft. The dyspnœa of cardio-renal disease, as well as the breathlessness of certain other morbid conditions, is to a large extent brought about by an increase of non-volatile acids in the blood. The cause of such change in the reaction of the blood may be renal insufficiency, or may be some alteration in the metabolism of the organism. Such work is fundamental in character and tends to shatter our old traditions of insufficient aeration of the lungs with consequent accumulation of carbon-dioxide in the blood as the cause of breathlessness.

The fifth lecture is of particular clinical value; its title is "Observations upon cardiac syncope." That syncope may result from certain alterations in the heart's mechanism, such as complete heart-block, has long been known. That it can be brought about by other altered mechanisms, as paroxysmal tachycardia and auricular flutter is clearly shown. Syncope followed by death from ventricular fibrillation is suggestive, and offers a field for research from which much can be expected. T. F. C.

PASTEUR AND AFTER PASTEUR. By STEPHEN PAGET, F.R.C.S., Hon. Sec. Research Defence Society. 152 pages, with eight page illustrations. Medical History Manuals. London: Adam and Charles Black, 1914.

The author, in his preface, rightly says that M. Valery Radot's "Life of Pasteur," which was translated into English by Mrs. Devonshire, with an admirable preface by Sir William Osler, is one of the best of all books, and Mr. Paget hopes that his own little book may be regarded as a sort of signpost on the way toward the well-beloved *Vie de Pasteur*. It has been said of Pasteur that he was "the greatest man who ever entered into the kingdom of Science," and few who have had the privilege of reading the larger "Life" will be inclined to think the statement exaggerated. In the present book also the beautiful character of the man stands out, and the wonderful development of his genius is traced. To us, looking back, the progress of his researches seems almost inevitable—from chemistry to crystallography, leading in turn to fermentation, to the diseases of wine, to those of silk-worms, of poultry, of sheep, and of man, and making possible the work of Lister and the science of bacteriology. More than half the book is taken up with these two immortal names. The rest deals with the later development in our life-saving knowledge of the epidemic diseases, from tuberculosis and diphtheria to the recent conquest of yellow fever. Mr. Paget's mastery of English is well known. His book will appeal not only to the physician. It is extraordinarily free from technical language, and no better work could be put in the hands of the layman willing to learn of the hopes and triumphs of preventive medicine, and the steps by which they have been realized.

THE following doctors left New York on April 17th. They form the personnel of two Red Cross Field Hospitals, which will be attached to the Belgian army and stationed at La Panne. Dr. Albert R. Goodman, of New York, Dr. William H. Morris, of Baltimore, Dr. John D. Spellman, of Cincinnati, and Dr. Karl B. Morrow. On arrival in England they will be joined by Dr. Robert W. Hinds, of Buffalo and Dr. William T. Fitzsimmons, of Kansas City.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

PRACTICAL MEDICINE SERIES. Edited by C. L. MIX and R. T. VAUGHAN. Chicago: Year Book Publishers, 1914. Vol. VII. Obstetrics. Edited by J. B. DELEE, with the collaboration of H. M. STOWE. Price, $1.35. Vol. VIII. Materia Medica and Therapeutics; Preventive Medicine; Climatology. Edited by G. F. BUTLER, H. B. FAVILL, NORMAN BRIDGE. Price, $1.50. Vol. X. Nervous and Mental Diseases. Edited by H. T. PATRICK and PETER BASSOE. Price, $1.35.

SELECTED ADDRESSES ON SUBJECTS RELATING TO EDUCATION, BIOGRAPHY, TRAVEL, ETC. By JAMES TYSON. Philadelphia: P. Blakiston's Sons and Company, 1914.

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Res Judicatæ

FEEBLE-MINDEDNESS AND THE STATE

ON page 405 of this issue will be found the results of eighty-seven mental tests carried out by Dr. Mundie at the Boys' Farm, Shawbridge. Dr. Mundie's paper is sufficient in itself to indicate the gravity of the situation, but some further statistics may be of interest, particularly just now when questions bearing on the future of the race assume an additional importance. According to a conservative estimate, there are in Canada at least 25,000 mental defectives; in the province of Ontario there are at least 5,000, and in Quebec no less than 6,000. In the latter province it is difficult to make a correct estimate as, in the absence of compulsory education, psychological clinics, or other means of detecting cases, it is impossible to obtain reliable information and, in the case of children, those who obviously are defective are usually kept at home. Dr. Helen McMurchy, inspector of the auxiliary classes recently established in Ontario, estimates that there are at least 2,000 feeble-minded children in the ordinary schools of the province, and that thirty-three per cent of those in the industrial schools and fifteen per cent. of those brought before the Juvenile Court of Toronto are mentally defective. In April, 1914, scientific tests of the mentality of eight inmates of the Girls' Cottage Industrial School at St. Lambert, P. Q., were made by Dr. Tait, professor of psychology at McGill University. All were morons, that is, mental defectives of the higher grade. Seven of the eight had been born in the Old World. Dr. Tait also examined thirty-seven children selected at random at another institution in Montreal; of these only fifteen were normal. In another case thirteen out of twenty children examined showed two or three years retardation and were, presumably, feeble-minded. In Great Britain things are even worse. In the report of the Royal Commission, published in 1908, it is stated that at least 120,000 persons in England and Wales are mental defectives and that 66,000 were in urgent need of proper care. This estimate was considered too low by Dr. Tredgold, a member of the Commission, who thought that there were at least 150,000 feeble-minded persons in England and Wales alone. In the *Journal of Heredity*, January, 1915, Dr. Goddard states that there must be between

300,000 and 400,000 feeble-minded persons in the United States, with many more in whom mental defect is latent, and it is believed that in the State of New York alone there are 30,000 feebleminded persons. The results of tests made by the Binet-Simon and other approved methods have made it sufficiently clear that mental defficiency is associated with criminal tendencies. The first Ontario census of the feeble-minded was taken in 1906 and revealed the existence of 1,000 mental defectives supported by public charity. Mr. Chadwick, superintendent of dependent and delinquent children in Alberta, in March, 1915, stated that 200 children ranging from idiots to morons had come under his notice, and Mr. Page, superintendent of neglected and dependent children in Saskatchewan, at the present time has under his care at least twelve boys suffering from extreme mental defects. In the United States Goddard estimates that from 25 per cent. to 50 per cent. of all classes of criminals in that country are mental defectives, and his findings are corroborated by the work of Fernald and others. In England the reports of the Royal Commissions show that paupers, drunkards, prostitutes and criminals are recruited from the ranks of the feeble-minded. Until quite recently the prevailing opinion was that feeble-mindedness was the result of other evils, but in the light of recent research, the picture is reversed and evidence points rather to the fact that excesses and crime are the result of low mentality, and that mental deficiency in all its stages is directly inherited and incurable. In a work entitled "Feeble-mindedness," Dr. Goddard has recently published the family histories of the inmates of the institution at Vineland, New Jersey. He gives genealogies of 327 families, including 11,389 individuals and finds that 54 per cent. had inherited feeblemindedness directly from their parents and that 73 per cent. belonged to families with marked hereditary neuropathic tendencies. No geniuses were discovered in any of these families and the majority of the so-called normal members were of a low grade of intelligence. All doubtful individuals were classed as normal. It is unnecessary here to enumerate further instances, but to illustrate the expense incurred by the state, mention may be made of the famous Jukes family studied by Dugdale, which has already cost the State of New York over $1,250,000.

Studies have been made of the effect of immigration on the proportion of feeble-minded people, both in Canada and in the United States, and it has been found that the increase in crime, as a whole, and in offences against the person have been in proportion to the increase in immigration. Obviously, redress lies here in stricter immigration laws.

Human nature is always prone to procrastination, and the segregation of defectives, the only effective measure, involves the expenditure of large sums of money which at this juncture can ill be afforded. The advantages of segregation have been proved by the success obtained in Northern Italy, where in the valley of Aosta cretins have almost disappeared. For centuries the goitrous cretin had been an object of charity and the number had increased until the neighbourhood was infested with them. In 1890 the sexes were segregated in separate colonies and in 1910 they had practically disappeared.

The question of feeble-mindedness is not one that can be adequately dealt with by any one province; the efforts of one province may be nullified by the carelessness of another. It is a matter that should be dealt with by the Federal Government. The National Council of Women of Canada have realized this and on March 12th, last, a delegation from the Council waited upon the Premier with the request that a Royal Commission be appointed to consider the matter of mental deficiency. Sir Robert Borden promised that the request should receive consideration. A similar appeal was made to Sir Lomer Gouin, premier of the province of Quebec, by the Montreal Local Council of Women, supported by many other societies both Protestant and Roman Catholic.

A PRIZE of $1,000 is offered by the Metropolitan Life Insurance Company to be awarded by a committee of judges selected by the American Social Hygiene Association to the author of the best original pamphlet on social hygiene for adolescents between the ages of twelve and sixteen years. Manuscripts should not exceed 3,500 words; they must be original and must be written in the English language. They should be addressed to The American Social Hygiene Association, 105 West 40th Street, New York, and must be received not later than July 31st, next. Further information may be obtained from the above association.

Obituary

Dr. Alexander A. Dame, of Toronto, died suddenly March 23rd, in the sixty-ninth year of his age, when on his way to attend the funeral of a friend. Dr. Dame graduated from Queen's Medical College in 1886. He practised first at Jordan and from there went to Toronto. He then went to Europe and took up the study of the eye, ear, nose and throat. On his return to Canada in 1905 he went into practice at Galt, but three years later returned to Toronto. Dr. Dame was a member of the militia and was regimental surgeon of the 48th Highlanders. He leaves one son.

Dr. Cyrus Smith died in March at Glanford, Ontario.

Dr. William R. Bell, of Ottawa, died March 22nd, at the age of eighty-one years. Born in England, at Thirsk, Yorkshire, in 1833, Dr. Bell came to Canada in 1866. He had already studied medicine at Marshall College, Aberdeen, and had also done post-graduate work in Scotland and on the Continent. He became well known as a surgeon and continued to practise until about six months before his death. Dr. Bell was director of the Protestant General Hospital for many years. He was surgeon of the Ottawa Field Battery and an officer in the Governor-General's Foot Guards retiring with the rank of lieutenant colonel. He leaves a widow and seven sons, one of whom is Dr. David W. Bell, of Ottawa.

Dr. J. R. Clouston, of Huntingdon, Quebec, died March 29th. Dr. Clouston was born in the Orkneys, Scotland, in 1857; two years later he came with his parents to Leeds, Megantic County, Quebec. In 1888 he graduated from McGill University. He practised at Howisk for two years and then went to Huntingdon, where for twenty years he has been coroner. He leaves a widow, one son, Dr. Howard Clouston, and four daughters.

Dr. Enoch Emerson died at Spring Arbor, Michigan, March 25th, in the fifty-first year of his age. Dr. Emerson was born at Mersea, Ontario.

Dr. Arthur G. Allan died from heart failure at Valleyfield on Saturday April 3rd. He was over sixty years of age.

Dr. T. A. Amos, of Exeter, Ontario, died March 25th, in the fifty-fifth year of his age. Dr. Amos was well known throughout the district and had a large practice; in fact, a short time ago, his health compelled him to give up his practice in Ontario. He went to Alberta and practised there for a short time but returned to Exeter. He graduated from Trinity Medical College; after graduation he went to Glasgow, Edinburgh, and London, where he did some postgraduate work and obtained the degrees of L.R.C.P. and L.R.C.S.

Dr. Ovide Lesage, of Saint-Tite de Champlain, Quebec, died of pneumonia April 2nd, in the thirty-first year of his age. Dr. Lesage graduated from Laval University in 1909. He leaves a widow.

Dr. Herbert Huntington Read, of Halifax, died April 5th. Dr. Read, who was about seventy-five years of age, was born at Minudie, Nova Scotia; he graduated from McGill University in 1861, and then went to Edinburgh where he obtained the degree of L.R.C.S. Dr. Read afterwards went to the United States and took up the study of homeopathy, which he practised during his long residence in Halifax. He leaves two sons and four daughters.

Dr. O. C. Edwards died April 4th, at the age of sixty-three years. Dr. Edwards died at the Indian Blood Reserve, near Macleod, Alberta. He had been government physician on Indian reserves since 1887.

Dr. George Ford, of Stratford, Ontario, died April 19th, in the thirty-eighth year of his age. Born and educated in Listowel, George Ford taught for a few years before entering upon the study of medicine. He graduated from the University of Toronto as silver medalist in 1906, after which he did post-graduate work in England and Scotland. He practised at Shakespeare for seven years and last year removed to Stratford. He leaves a widow and one son.

Dr. J. W. Corrigall, of Limerick, died at Weyburn, Saskatchewan, April 13th, in the thirty-sixth year of his age. Death was due to pneumonia. He leaves a widow and one child.

Dr. James Spence, of Toronto, died April 19th, in the sixty-first year of his age. Dr. Spence was born at Elora in 1854; he was educated at Rockwood Academy and graduated from the University of Toronto in 1884. He first practised at Millbank and in 1886 removed to Toronto. Dr. Spence took an active interest in educational work, He leaves a widow, one son, and one daughter.

Dr. James E. Griffith, of Edmonton, Alberta, died March 5th. Dr. Griffith was born at Woodstock. He first went into practice at St. John, New Brunswick, but for the past twenty years had practised in the West. His wife predeceased him by eleven days.

Dr. Angus A. McLellan, of Summerside, Prince Edward Island, died in Montreal March 20th, in the fifty-eighth year of his age. Death was due to an accident sustained in Montreal while Dr. McLellan was visiting his son who is at McGill University. Dr. McLellan was born at Grand River; he graduated in medicine from McGill in 1889. He went into practice at Souris and, in 1904, removed to Summerside and took up the practice of his brother, the late Dr. James McLellan. He leaves a widow, five sons, and three daughters.

Dr. Geo. H. Sweet died at Saginaw, Michigan, in the forty-fourth year of his age. Dr. Sweet was born in Hamilton, Ontario.

Dr. R. T. Aikman, of Grimsby, Ontario, died from pneumonia on April 13th. Dr. Aikman, who was a son of the late Colonel John Aikman, was born at Ancaster in 1841. After graduating from McGill University, Dr. Aikman went into practice at Burlington. He removed from there to Collingwood where he continued to practise until about eight years ago. He leaves a widow and one son.

Dr. Donald Percy McCrea died at Cohocton, N.Y., April 11th. Dr. McCrea was born at Easton's Corners, Ontario. He graduated from Queen's University in 1901.

Among the victims of the typhus fever epidemic in Serbia is Dr. Ernest P. Magruder, of Washington. Dr. Magruder was serving with the American Red Cross at Belgrade.

News

ONTARIO

An outbreak of typhoid fever is reported from Point Anne, near Belleville.

The Galt hospital by-law was passed recently with a majority of eighty-two votes. It provided $15,000 to pay off a deficit on the new wing of the hospital.

The annual meeting of the London Health Association was held April 9th. Sir Adam Beck was unanimously reëlected president of the Association.

Dr. H. A. Boyce, who has been medical superintendent of the Kingston General Hospital for the past seven years, has resigned and intends to go into practice in Kingston. His successor is Dr. D. A. Coon. Dr. Coon graduated from Queen's in 1890 and has been practising in Elgin until a few months ago, when he removed to Kingston.

The St. Joseph's Hospital at Hamilton is to be enlarged. It is proposed to spend $125,000; the plans were prepared some months ago, but it was considered wise to delay the work for a time.

Dr. J. P. Sinclair has been appointed medical officer of health of Gananoque.

The question of reform in the Dominion penitentiaries is now receiving the consideration of the Department of Justice and new regulations are being dfrated in accordance with the suggestions made by the recent Royal Commission on the Kingston Penitentiary and the views of the wardens of the various prisons in the Dominion.

The Brantford General Hospital has been enlarged. The new wings were formally opened April 15th.

Dr. J. W. S. McCullough has been appointed assistant sanitary expert to the International Waterways Commission.

MARITIME PROVINCES

Dr. David Townsend, Superintendendent Jordan Memorial Sanatorium, River Glade, N.B., visits Fredericton, first Wednesday; St. John, first Thursday; and Moncton, second Thursday of each month, for the purpose of conducting a clinic in tuberculosis, in the interests of the Jordan Memorial Sanatorium. These clinics, although primarily for the selection of cases for the Sanatorium, are open to anyone, free of charge, for opinion and advice in tuberculosis.

It is proposed to build a civic hospital at Sydney, Nova Scotia.

QUEBEC

The fourth annual meeting of the District of Bedford General Hospital at Sweetsburg was held March 24th. The superintendent reported that during the year 1914 one hundred and nine patients were treated in the hospital, ninety-nine were discharged, and eight died. In the outdoor clinic two hundred and sixty patients received treatment.

The thirty-fourth annual meeting of the Notre Dame Hospital, Montreal, was held on March 30th. The financial statement for the year 1914-15 showed a deficit of $3,502; the members of the executive committee, however, have come to the aid of the hospital and had subscribed $4,480, so that the present financial year commences with $978 in hand. During the past year 2,464 patients were treated in the hospital, the average length of time each patient stayed in the hospital being eighteen and one-half days. In the dispensary 22,579 consultations were given. The report was read of the superintendent of the St. Paul Hospital. The lack of accommodation made it necessary to refuse admittance to 102 patients during the year. The number admitted was 1,183, including 479 cases of diphtheria, 424 of scarlatina, and 154 of erysipelas. The death rate was 8·1 per cent.

The Andrews Home, Montreal, has been converted into a convalescent home for soldiers with accommodation for seventy patients. It is intended primarily for soldiers invalided from the front, who are expected as soon as navigation opens, but it will also be used for men who have become sick while in training and who have been discharged from hospital but are not fit for duty.

The home was formally opened by the H. R. H. Duke of Connaught on Wednesday, April 21st. On Tuesday, the 20th, H. R. H. the Duchess of Connaught paid a visit of inspection to the Montreal Foundling and Baby Hospital. H. R. H. unveiled a tablet to the memory of the late Colonel J. H. Burland, to whom the hospital owes so much.

MANITOBA

Scarlet fever is reported to be very prevalent among the school children of Portage la Prairie.

ALBERTA

Dr. George R. Pirie, of Calgary, has been appointed superintendent of the Great Ormonde Street Hospital for Children, London.

The annual meeting of the Red Deer Memorial Hospital took place March 30th. During the twelve months under consideration 260 patients were admitted, 249 were discharged, and 10 died.

Dr. Robert Woods, medical officer of health at Leduc, has resigned.

SASKATCHEWAN

The provincial hospital at North Battleford is to be enlarged by the addition of a 360-foot wing. Construction is to be commenced at once.

BRITISH COLUMBIA

The sum of $469.57 has been forwarded to England by the St. John Ambulance Association of British Columbia. The money has been subscribed towards the maintenance of a cot in the hospital provided by the St. John Ambulance Brigade.

Dr. W. D. Keith, president of the Vancouver Medical Association, and Dr. Underhill, of Vancouver, have been officially appointed examiners for the Red Cross. The lecturer in hygiene, sanitation, home nursing, and first aid is Dr. Scarlett-Synge.

MEDICAL COLLEGES

McGill University

THE convocation held on Thusday, April 22nd, was an event unique in the history of McGill University. The University was honoured by the presence of Their Royal Highnesses the Duke and Duchess of Connaught and the Princess Patricia. The students and most of the professors were in uniform, as befitted the occasion: that of conferring degrees on members of the McGill Military Hospital. His Royal Highness presented the diplomas, the degrees being conferred by Principal Peterson. The following is the list of candidates who received their M.D., C.M.

G. R. Baby, of Hamilton, Ont.; P. B. Belanger, Bridgetown, Barbados; O. Demuth, Penticton, B.C.; H. E. H. Eberts, B.C.; C. D. Kean, Brockfield, Bonavista Bay, Newfoundland; G. L. D. Kennedy, Ottawa, Ont.; G. F. Laing, Windsor, Ont.; L. H. Leeson, Vancouver, B.C.; B. F. MacNaughton, Hopewell Cape, N.B.; H. K. Neilson, Arnprior, Ont.; I. D. Ramsay, Waskada, Man.; A. D. Sharp, Summerside, P.E.I.; D. Lee Smith, Vancouver, B.C.; W. Templemen, St. John's, Newfoundland; F. S. Walcott, St. James, Barbadoes; C. O. Walsh, Guysboro, N.S.; H. C. West, Avonmore, Ont.; A. B. Wilkes, Brantford, Ont., and R. D. Wilson, Hull, Iowa.

The degree of Bachelor of Arts was conferred upon William Wentworth Beveridge, of Vancouver; Clinton Edgar Manning, of Magog, Que.; and Walter de Mouilpied Scriber, of Westmount, and the following were recipients of the degree of Bachelor of Science in Agriculture, Henry Illsley Evans of Hampton, King's County, N.B.; Richard Edey McKecknie of Wyman, Que.; Homer Dean Mitchell of Drummondville, Que.; and Harold Freeman Williamson, of St. Anne de Bellevue, Que.

In addition to these, the degree of B.A. *ad eundem* was conferred upon Major Allan Angus Magee, a graduate of Toronto University, in recognition of his services in connexion with the training of the McGill Battalion.

His Royal Highness spoke in warm terms of the hospital unit, which was reviewed on the campus just before convocation. The nurses who will accompany the hospital were drawn up on the left and the dark blue of their uniforms was in pleasant contrast to the khaki of the officers and men. The inspection was watched with interest by T. R. H. the Duchess of Connaught and the Princess Patricia, who were presented with bouquets of roses, tied with the McGill colours, by Mrs. Birkett and Mrs. Yates.

In the evening, His Royal Highness was the guest of the officers of No. 3 General Hospital at a dinner given at the barracks, St. George's Home. The Duke was accompanied by his aides, Col. Stanton and Major Duff, and there were also present: Col. E. W. Wilson, O.C. 4th Division; Principal W. Peterson; Prof. A. D. Blackader, acting dean of the faculty of medicine at McGill during the absence on active service of Col. H. S. Birkett; Lieut.-Col. H. M. Jaques, who is proceeding to England as deputy assistant director of medical services, C.E.F., and Lieut. von Eberts.

Col. H. S. Birkett presided, and the other officers of the hospital present were: Lieut.-Col. H. B. Yates, second in command; Lieut.-Col. J. M. Elder, Major E. W. Archibald; Major W. H. P. Hill, Major A. C. P. Howard, Major J. C. Meakins, Capts. J. G. Browne, H. C. Burgess, H. C. Dixon, W. T. Ewing, W. W. Francis, A. T. Henderson, D. A. Hingston, W. B. Howell, J. W. Hutchinson, D. Law, H. M. Little, J. A. MacMillan, L. H. McKim, R. St. J. Macdonald, R. H. Malone, A H. Pirie, A. Stevenson, L. L. Reford, L. J. Rhea, R. Robertson, C. K. Russel, F. W. Tidmarsh, L. H. Thornton, W. G. Turner, J. C. Wickman and W. A. Wilkins.

Toronto University.

THE following received their medical degree from the University on Friday, April 9th, preparatory to accompanying No. 4 General Hospital: R. S. Armour, C. R. B. Crompton, J. R. Howitt and H. B. Van Wyck.

THE university authorities are sparing no effort to make the base hospital which has been accepted by the War Office as efficient as possible. The hospital will consist of 1,040 beds. The staff will be composed of one colonel, four lieutenant-colonels, eight majors, twenty-six captains, two quartermasters, four warrant officers, two matrons, eighty-four nursing sisters, and two hundred and eighty-four rank and file. This means that forty-five men must be provided from the present staff of the university. A prompt response has been made by the nurses and more than one hundred have volunteered already. The government will grant the equipment required by military regulations, but small provision is made for the equipment of laboratories, an important part of any efficient hospital. In addition to that required for laboratories and that provided by the government, further equipment is needed; and, similarly, in other departments of hospital work a considerable expenditure of money must be made; it is estimated that at least $25,000 will be needed and an urgent appeal is made for financial assistance. All subscriptions may be sent to Dr. A. Primrose, Secretary of the Faculty of Medicine, University of Toronto.

The unit will be known as No. 4 General Hospital and the following, it is expected, will be the personnel: Colonel J. A. Roberts, in command. Major W. B. Hendry, Captain N. J. L. Yellowlees. The surgical staff will consist of Drs. Alex. Primrose and Walter McKeown (equal military and surgical rank), Dr. J. Malloch, Dr. B. P. Watson, Dr. E. S. Ryerson, Dr. George E. Wilson, Dr. Robert Gaby, Dr. F. W. Watts, Dr. J. G. Gallie and Dr. H. Wookey. The medical staff will consist of Drs. Andrew Gordon and Graham Chambers (equal military and medical rank), Dr. Chas. S. McVicar (secretary registrar), Drs. Donald McGillivray, Harold Parsons, D. K. Smith, Geo. F. Boyer, R. G. Armour, J. H. McPhedran and S. R. D. Hewitt. Dr. Gilbert Royce will have charge of the nose and throat department; Dr. W. E. Lowrie will have charge of the eye department; Dr. Robert Pearse will be chief in genito-urinary work; Dr. J. A. Amyot will be placed in charge of sanitation. The laboratory staff will be composed of Drs. Duncan Graham, N. C. Sharpe, A. A. Fletcher and C. J. Imrie. Dr. Geo. Gow will be the dental surgeon. A most efficient nursing staff has been secured. The nurses have been chosen exclusively from the standpoint of efficiency and the result is an unusually capable staff.

No. 2 Clearing Hospital, which was mobilized at the old General Hospital on Gerrard Street, is ready to leave for the front. The officers are: Lieutenant-Colonel G. S. Rennie, Lieutenant-Colonel J. E. Osborne, and Major R. Davey, of Hamilton; Major F. W. E. Wilson, of Niagara Falls; and Captain George S. Strathy, Captain H. L. Jackes, Captain L. B. Robertson, and Captain G. B. Strathy, quartermaster, all of Toronto. The medical staff consists of fourth and fifth year medical students. The latter were given the degree of Bachelor of Medicine the last week of February and have since received automatically the rank of lieutenant. They are: Lieutenants Gerald Allison, Stanley Stafford Ball, Arthur McKnight Bell, M.A., Leeming Anderson Carr, Henry Arthur Cates, John Chassels, Frederick Russell Gillrie, Morley Edward Gorman, Frederick Walter Clement, Richard Collier Coatsworth, B.A.; Harold Parrish Hamilton, Maurice Round Helliwell, William Wray Hodge, B.A., Herbert Carl Martin, Athol Alexander Moon, Paul Michael O'Sullivan, M.A., Reginald Paul, Harry Roy Smith, Thomas Harold Douglas Storms, B.A., Stanley Young Walsh, David Edmund Staunton Wishart, B.A. The fourth year men who accompany the hospital are: W. E. Hodgins, A. C. Norwich, A. R. Hagerman, A. E. Macdonald, W. C. Connell, J. A. Stanley, A. B. Jackson, A. R. Lindsay, L. R. Hill, P. A. Sarjeant, M. J. Wilson, J. H. Sharpe, G. Scullard, W. B. Rutherford; and in addition there are the following third year men: H. C. Cruikshank, J. S. Reid, G. F. Sykes, and J. H. Howell. The two doctors of dentistry, who received their degrees, are Richmond Henry Atkey and Albert Gordon Lough. Captain L. E. Williams, formerly a resident member of the staff of the Toronto Asylum is also accompanying the hospital.

With the present staff of fifty-two officers and men there will go a large number of service men, bringing the final complement to seventy-seven, but these have not all been selected. They will consist of carpenters, cooks, bricklayers, one barber and several mechanics. Some of these are already under orders at the old General, and are being utilized in the construction of immediate needs.

The hospital equipment will not be provided until the men reach England, and no patients will be treated until the clearing hospital reaches the front. The duties of this hospital differ entirely from those of the University base hospital. The clearing hospital carries with it no nurses, and follows closely the line of battle, establishing its temporary camps in the wake of the ambulances. The wounded are brought here first, and after treatment are removed to the base hospitals.

Queen's University

The military hospital offered by Queen's University, and accepted by the War Office, will be designated No. 5 Stationary hospital. Official confirmation of the personnel has not yet been received from Ottawa, but the following is the list of officers submitted: Officer in command, Lieut.-Col. Etherington; surgeons, Capt. C. E. Kidd, Lieut. Ballantyne, Lieut. Polson; civil surgeons, Dr. Anglin, Dr. W. T. Connell, Dr. Garfield Platt; dental surgeon, Capt. Ernest Sparks; radiographer Lieut. J. P. Quigley; quartermaster, the Hon. Capt. Jas. Wallace, Chaplain of the 45th Regiment.

Two hundred beds will be provided and to obtain the necessary equipment for an efficient hospital, at least $5,000 will be required. Subscriptions to the amount of $1,345 have already been received and no doubt, as in the case of the hospitals given by McGill and Toronto universities, graduates and friends of the university will respond generously to the needs of the occasion. A subscription of $25.00 will purchase the supplies necessary for one bed, which will be named after the donor. While the hospital is on active service, an effort will be made to send $300 a month towards its maintenance.

ARMY MEDICAL SERVICES

A WESTERN contingent of the Army Medical Corps, in command of Captain Crowe, of Winnipeg, left Halifax early in April. It comprised detachments from Victoria, Vancouver, Edmonton, Calgary, and Winnipeg, and was accompanied by twenty-five members of the Army Medical Corps from Halifax. Among the members who will serve in various hospitals in France, particularly in Nos. 1 and 2 Stationary Hospitals, were fourteen officers and seventy-two men from Winnipeg, commanded by Captain Powell, of Saskatoon; six officers and twenty-five men from Vancouver and an equal number from Calgary. The officers in the detachment from Calgary were Lieutenants W. J. McAllister and T. M. Taylor, of Calgary; Lieutenants W. H. Scott and H. J. Collins, of Edmonton; Lieutenant T. W. Moore, of Lundbreck, and Lieutenant T. S. Tupper, of Claresholm. The Vancouver detachment included Captain Ridewood, Captain McLellan, Lieutenant Rice, Lieutenant McMain and Lieutenant Hall.

DR. HERBERT E. CLUTTERBUCK, of Toronto, has been appointed chief surgeon at No. 13 Base Hospital, Boulogne, in succession to Major Butler, who was taken ill.

THE following Canadian doctors have been accepted by the Serbian government for civilian practice in Serbia: Ferdinand Perras, Montreal; Irma LeVasseur, Quebec; Brault, Port Daniel; J. Richardson, Quebec; Albert Palin, Winnipeg; John Hetherington, Carievale, Saskatchewan; W. Bourjeantz, Marcelin, Saskatchewan; P. E. Lavoie, Marcelin, Saskatchewan; A. W. M. Leclair, Letellier, Manitoba, and A. Avila Walters, Quebec. Physicians must be prepared to practise in Serbia for at least three months. Travelling expenses will be paid and salaries will commence from the date of arrival in the country. In case of death, the sum of $2,000 will be paid to surviving relatives.

Dr. Oscar A. Cannon, of Stratford, Ontario, left Halifax on April 10th, on his way to the Front. Dr. Cannon will probably serve as surgeon-in-chief to the Army Medical Corps reinforcements.

A request was made a few weeks ago through the Director-General of Medical Services, Ottawa, for additional names of medical practitioners willing to join the services. The rate of remuneration will be twenty-four shillings a day with rations or allowance; £30 for outfit allowance and £7 10s. for camp kit. The period of service will be for one year, or as long as required, with a gratuity of £60 on expiration of service and free passage to England. Doctors must be under forty years of age and must join the Canadian Army Medical Corps. Practitioners from provinces which have established reciprocal relations with the British General Medical Council only will be accepted. Nearly one hundred and twenty-five doctors from the province of Ontario alone responded to the appeal and the following have been accepted: E. F. Frederick, Peterboro; J. F. McLay, Grimsby; J. W. Sutherland, Ottawa; G. C. Anglin, Weston; T. O. Hutton, Sault Ste Marie; Victor McWilliams, Toronto; W. E. Pickup, Fort William; J. C. McLeod, Kincardine; A. F. Mavety, West Toronto; R. E. Hotkins, Toronto; J. N. Humphrey, Toronto; F. M. Walker, Toronto; H. W. Kerfoot, Penetang; K. G. McKenzie, Exhibition Camp; F. W. M. Smith, Bayfield; N. King Wilson, Toronto; O. W. Colbeck, Haileybury; A. Henderson, Toronto; R. Tennent, Belleville; E. A. Urie, Guelph; C. F. Wright, Iroquois Falls; F. J. Livingstone, M. H. Patterson, Toronto; Austin Evans, Whitby; H. Crassweller, Windsor; J. V. Brown, Exhibition Camp, Toronto; R. L. Shields, Port Hope; W. J. Marcey, Parry Sound; F. J. Colling, Toronto; A. H. Machlen, Goderich; L. M. Dawson, Ottawa; K. M. Simon, Toronto; R. H. Bonnycastle, Campbellford; J. J. Middleton, Toronto; J. Edward Knox, Toronto.

Two deaths from cerebrospinal meningitis have occurred among the members of the 29th Battalion stationed at Belleville.

Dr. Neiley, of New Glasgow, Nova Scotia, is serving with one of the hospitals in France.

Dr. Thomas Stanley Rippon, of Edmonton, has joined the R.A.M.C. Dr. Rippon went to England last November.

Dr. L. C. Harris, of Edmonton, has enlisted as a surgeon in the A.M.C.

The offer made by the physicians of Peterborough, Ontario, to organize a base hospital for service in any part of Europe, including Serbia, has been accepted. The unit will be equipped by the government but the expenses of maintenance while on service will be defrayed by the citizens of Peterborough. The physicians of the city who are not on active service will contribute $50 a month, the lawyers an equal sum, and the citizens the balance of the amount required. Sheets and other supplies will be provided by patriotic societies.

The members of No. 6 Field Ambulance left Montreal on Friday, April 16th, en route for the front. They had been in training for five months. The unit was commanded by Lieutenant-Colonel R. P. Campbell, Major T. F. Murphy being second in command. Among the officers was Captain Andrew Macphail, the editor of this Journal. The other officers were Major Phillip Burnett, Captain R. H. M. Hardisty, acting adjutant, Captain A. B. Walter, Captain D. W. McKechnie, Captain S. G. Ross, Captain H. P. Wright, Lieutenant A. M. Sclater, quartermaster, and Lieutenant G. S. Cameron, dental surgeon. The unit comprised two hundred and seventy men.

The following promotions in the Canadian army Medical Corps are gazetted: Lietutenant-Colonel H. S. Birkett has been made Colonel; Lieutenant-Colonels J. W. Bridges, M. MacLaren and G. L. Foster temporary colonels; Major C. F. Wylde, Brevet Lieutenant-Colonel F. L. Vaux, and Major S. H. McKee temporary lieutenant-colonels; Captains A. C. Rankin, E. M. Vesey, C. H. Morris, J. L. Duval, H. G. Nyblett, A. M. Forbes, and H. E. Munroe temporary majors.

Dr. C. M. Burroughs, of Sudbury, Ontario, has enlisted for service in the Army Medical Corps.

Dr. J. G. Adami, who has been appointed to represent Canada on the British commission entrusted with the preparation of a medical history of the war, has been given the temporary rank of lieutenant-colonel.

Dr. C. Wilson, of London, Ontario, is attached to the Red Cross in France. Dr. G. H. Wilson, of London, is the medical officer of the 7th Regiment, Canadian Mounted Rifles.

Dr. Howard Harrison, of Toronto, is serving as surgeon on one of the channel transports.

Drs. Smith, Wickware and Brown, of Moose Jaw, have received appointments in the Royal Army Medical Corps.

Dr. Clifford K. Robinson, of Tamworth, has volunteered for active service in the Army Medical Corps.

Dr. J. R. Irwin, of Cobourg, has volunteered for active service.

Lieutenant-Colonel D. W. McPherson, of Toronto, is in command of Manor Hospital, Wiltshire, England.

Drs. Irving, Laidlaw, McNutt, Valery, Neff, Jr., Fyshe, Rankin, A. R. Robertson, Harris, H. L. Collins, and W. H. Scott, all of Edmonton, are on active service. Lieutenant-Colonel Harwood is in command of the fifty-first regiment.

Dr. W. A. Groves has been appointed medical officer to the troops stationed on the Exhibition grounds at Toronto, in succession to Dr. A. Croll, who has left for the front.

Dr. W. R. Mason, of Parry Sound, Ontario, has volunteered for service with the St. John's Ambulance Corps detachment in France.

The French-Canadian Stationary Hospital, No. 4, which is being recruited in Montreal, will be in command of Lieutenant-Colonel Arthur Mignault who has done so much in connexion with the formation of the 22nd and 41st French-Canadian Regiments. The personnel of the hospital will consist of a lieutenant-colonel, two majors, four captains, and a quartermaster, with ninety-five rank and file and thirty-five nurses. The following is the list of officers submitted to Ottawa for approval by Lieutenant-Colonel Mignault: Dr. E. Peltier, Dr. J. N. Roy, Dr. F. de Martigny, Dr. J. A. Lanoie, Dr. F. Pariseau, Dr. C. St. Pierre, and Dr. R. Laurier. Officers and nurses must speak both English and French.

Dr. A. Croll, of Saskatoon, has left for hospital service in France; he will probably be stationed at Havre.

The following description of No. 2 Stationary Hospital, C.E.F., is taken from a letter bearing date February 17th, and received by Professor Adami from one of his former assistants:

About the last week in January I was instructed to proceed to France, draw the equipment, fit up the laboratory and act as pathologist for the time being to No. 2 Stationary Hospital, Canadians, at Le Touquet. I arrived here February 1st. No laboratory equipment has been drawn, so I asked for and was given a nice bright room, and started to fit it up, which I am still doing. Our supplies are drawn from the English base medical depôt at Boulogne, which is fairly well supplied with chemicals but the big stuff has to be requisitioned specially from England and takes three weeks to a month to arrive. I will, however, if I get all I have asked for, have a very nice little laboratory which I hope to have in full running order long before you arrive.

This unit, No. 2 Stationary, Canadians, is under command of Lt. Col. A. S. Shillington, of Ottawa, and its officers are drawn, with the exception of myself, mostly from the Toronto and Ottawa medical units. The hospital, in time of peace a very fashionable golf club, is a very large four-storey building, and is admirably suited for use as a temporary hospital for various reasons, some of which are: numerous large rooms, well lighted, a profusion of bathrooms and lavatories, electric light, plenty of running water, large sun parlors, extending about three-fifths the length of the building, and numerous villas surrounding it which can be utilized for officers, nurses, and men's quarters. Aside from the suitability of the hotel itself for its present use, it is situated in a veritable paradise. Eight minutes' walk from the sea, it lies among the sand dunes, of which only the two rows running parallel to the shore are bare, or moderately so. About forty years ago some far-sighted individuals planted pine among the sand dunes over an area covering, I should say, a thousand acres, the sand in the small valleys has become grassed over and the pine trees have now reached adult size, the result being that the hotel is situated in a huge park with numerous drives through the woods. The roads are excellent, having for the most part a stone foundation and tar-cement surface, making them excellent for motoring. So the place is far from being a sandy wilderness. The golf-links are, of course, almost world-renowned. The sea-shore for miles is a sandy beach, on which at low tide you can walk in some places a third of a mile seawards. Two miles away is Paris Plage, a summer watering place, and about the same distance is the little fishing village of Etaples. The country about here is especially interesting in view of the present conflict, as it was at Etaples that Napoleon about one hundred years ago built his flat-bottomed boats for the intended invasion of England. Also it was behind the forest of Hardelot, about eight miles from here on the main road to Boulogne, that he encamped the army which he intended to throw across the Channel. From this you will judge that I have landed in pastures green, and rightly so. The weather since coming here has been good on the whole, but even with a little rain—unlike Salisbury Plain, where one is in mud to the eyebrows continually—the ground being sandy the water drains off in a few hours.

The hospital itself has about three hundred beds, with tent accommodation to double that if necessary. At present on account of the lull in the fighting, we are running light, our old patients are for the most part convalescent and gone. We are not encouraged to keep them long unless they are very seriously wounded, but are continually pressed to evacuate rapidly. When I came we had about a dozen German wounded, but with the exception of a couple they have now been discharged and sent across the channel. On the whole we are very well equipped and find the English depôt officials eager to give us anything we ask for if it is possible to obtain it. I expect to be doing the laboratory work here perhaps for the remainder of the war. From the present outlook it seems as though I may get time to continue the work I began in Glasgow, as I may have considerable spare time on my hands. I think it will be possible to rig up a rabbit hutch and get some animals, which I am told are very plentiful here. If the authorities give me the equipment I have asked for, I shall be able to do practically anything that comes up.

We lie about twenty miles due south of Boulogne, which is, as you probably know, the British hospital base. Near us are three other hospitals, the Duchess of Westminster's hospital at the Casino, and two French military hospitals both in hotels improvised for the purpose. We often see their patients pass our gates, and a motley crew they are with their variously coloured uniforms—Turcos, Zouaves and the French infantrymen, who wear a light blue coat and bright scarlet trousers. In Boulogne there are about a dozen hospitals. On Tuesday I paid a visit to No. 13 Stationary, English, where Sir Almwroth Wright has charge of the laboratory. Not having a letter or card from you I introduced myself to him and told him where I came from. He was extremely courteous and showed me various details about the laboratory. He also asked me if, as we were not at present busy, I would like to work in the laboratory with him, but of course I did not accept as I was not sure whether Col. Shillington would care to have me much away from here. The interesting thing in his laboratory, or rather, what I was most anxious to get after, is the work he is doing at present with anaerobes found in shrapnel wounds. The experience in this war, at least with us here, has been that bullet wounds are usually small, clean puncture-wounds, the bullet evidently sterilizing its way through. When it strikes a bone, however, contrary to what I have heard people say, it does not perforate, but smashes the bone into about a dozen pieces at the point of contact. Our *x*-rays are showing a very large percentage of cases in which this is happening. I have heard considerable talk about dum-dum bullets, but it would seem that the real reason is that the centre of gravity of the bullet is so situated that when it strikes bone, instead of going straight ahead, it flops and smashes everything. There are so many interesting things to write about, but I am afraid you will be tiring of these long epistles of mine. An interesting thing that has been noted here is the number of freaky bullet wounds—bullets in the neck, for instance, which shoot through without injuring the large important structures. One of the officers in No. 13 told me about a case there, a shot wound in abdomen; the bullet entered in one flank, ran across between skin and muscles, and came out the other side.

Shrapnel wounds, on the other hand, are usually more extensive and lacerating, and practically always infected, as clothing is carried in in almost every case. The piece of shrapnel is also usually found deep in the wound. Many of the shrapnel wounds are in the back and legs as the German shrapnel is placed to explode above and behind the English trenches and has a backward as well as a foreward kick. The shrapnel used by the English in the early stages of the war had, I believe, only a forward kick.

Of the actual fighting of course we see nothing and probably will see nothing, unless the Germans break through. The stories of the patients, however, are very interesting.

Canadian Literature

ORIGINAL CONTRIBUTIONS

Canadian Journal of Medicine and Surgery, April, 1915:

Uterine hemorrhage during pregnancy	K. C. M'Ilwraith.

Public Health Journal, April, 1915:

"Live a little longer," the Rochester plan	M. E. Bingham.
Salesmanship and business building	G. W. Allen.
Some theories and methods of ventilation	E. W. J. Hague.
Abstract of Tellscomian lectures	F. M. Sandwith.
Relation of psychiatry to public health	J. W. S. McCullough.
The reception hospital	J. M. Forster.
Facts in reference to the city (Winnipeg) milk supply	A. Rigby.

Western Canada Medical Journal, March, 1915:

President's address to the Manitoba Medical Association	H. A. Gordon.
Puerperal suppurating fibroids	E. A. Hall.

Canada Lancet, April, 1915:

Shortening of the intestinal canal for the relief of autotoxæmia	E. A. Hall.
Camphor as a heart stimulant	F. A. Clarkson.
Caffein as a heart stimulant	F. McPhedran.
The relation of the laboratory to the problems of mental hygiene	J. G. Fitzgerald

The Canadian Practitioner and Review, April, 1915:

Case reports of bromide eruptions	D. King Smith.
Subcutaneous injection of oxygen as a treatment for tetanus	H. O. Howitt and D. H. Jones.
The library of the Academy of Medicine	H. B. Anderson.
The present status of the library of the Academy of Medicine	J. H. Elliot.
The new Academy building	R. A. Reeve.
Mr. Gage and the doctors	J. Hunter.

Medical Societies

ONTARIO MEDICAL ASSOCIATION

Annual Meeting, Peterboro, May 25th, 26th, 27th and 28th.

Programme

Tuesday, May 25th—Registration.

Wednesday, May 26th—Morning—Registration.

Afternoon—General Session. Business Meeting.

Paper— "The local medical society." Dr. A. F. McKenzie, Moncton.

Evening—General Session. President's Address. Address in Medicine. By Dr. E. C. Rosenow, Chicago: "Variations in streptococci and their elective localizations in man and animals."

Reception by the President, Dr. D. J. Gibb Wishart and Mrs. Wishart.

Thursday, May 27th—Morning—Sectional Meetings.

Afternoon—General Session. Business Meeting. Address by Adam H. Wright, Toronto: "Medical education, specialties and fee-splitting." Address in Surgery.

Evening—General Session. Symposium on Heart.

(1) "Clinical electrocardiography" (with lantern slides), Julian Loudon.
(2) "Syphilis of the heart and aorta," A. McPhedran.
(3) "Treatment of a fever heart," H. B. Anderson.

Friday, May 28th—Morning—Sectional Meetings.

Afternoon—General Session. Business Meeting.

Section of Surgery.

1. "Tendon fixation in infantile paralysis," W. E. Gallie, Toronto.
2. "Local and spinal anæsthesia," J. R. Parry, Hamilton.
3. "Simple goitre and its treatment," F. N. G. Starr, Toronto.
4. "The treatment of arthritis," Dr. Seaborn, London.
5. "The principle of the surgical treatment of exophthalmic goitre," W. J. McDonald, St. Catharines.
6. "Empyema," W. A. Brown, Chesterville.

7. "Surgical aspects of neurasthenia," Dr. Fredericks, Peterboro.
8. "Cancer of the stomach," H. A. Bruce, Toronto.
9. "Abdominal pain," B. Z. Milner, Toronto.
10. "Renal function in surgical disease of the kidney," W. W. Jones, Toronto.

Section of Obstetrics and Gynæcology:

1. "Scopolamine-morphine narcosis in obstetrics," J. G. Gallie, Toronto.
2. "Serious vomiting in early pregnancy," K. McIlwraith, Toronto.
3. "Uterine discharges, their pathology and treatment," E. K. Cullen, Detroit.
4. "Cancer of the uterus, with reference to its early diagnosis," G. S. Cameron, Peterboro.

Section of Medicine:

1. "The relation of the mental hospital to the general practitioner's work," Harvey Clare, Toronto.
2. "The relation of school children to the tuberculosis campaign," J. H. Holbrook, Hamilton.
3. "Serum therapy," W. Goldie, Toronto.
4. "The use of radium and trichloracetic acid in dermatology," W. H. B. Aikins, Toronto.
5. "Observations on Blood Pressure," Dr. Emmerson, Goderich.
6. "Exophthalmic goitre," Dr. D. Smith, Stratford.
7. "Clinical manifestations of cerebrospinal syphilis," T. G. Phillips, Cleveland, O.
8. "The etiology of tetany—clinical and metabolic studies," Alan Brown, Toronto.
9. "Bowel conditions in epilepsy," Goldwin Howland, Toronto.
10. "Vagotony and duodenal ulcer," F. W. Rolph, Toronto.

Section of Eye, Ear, Nose and Throat:

1. "The treatment of tuberculosis of the larynx," Dr. Morton, Hamilton.
2. "The use of the electro-magnet in ophthalmic practice," R. A. Reeve, Toronto.

3. "The use of the broncho-tracheoscope and œsophagoscope in treatment," George Biggs, Toronto.
4. "Case reports," F. C. Trebilcock, Toronto.
5. "Ocular manifestations of disseminated sclerosis, with case report," Colin Campbell, Toronto.
6. "Demonstration of accessory sinuses diseases," Angus Campbell, Toronto.
7. "Some unusual features in a case of senile cataract extraction," G. H. Burnham, Toronto.

MANITOBA MEDICAL ASSOCIATION

THE annual meeting of the Manitoba Medical Association was held on February 18th and 19th in Winnipeg. It had been the intention of the Association to hold this meeting in Portage la Prairie during June or July, but for various reasons it was decided to accept the very kind invitation of the Winnipeg Medical Society to hold a combined meeting in Winnipeg during the Bonspiel, which is a great drawing card for Winnipeg. The programme was as follows:—

February 18th, morning session: Demonstration and Operations at Winnipeg General Hospital: Surgical Clinics by Drs. N. J. Maclean, J. E. Lehmann, H. P. H. Galloway, and J. Halpenny. Medical Clinics by Drs. William Rogers and E. S. Popham. Demonstration of Electric Cardiography by Dr. A. J. Burridge. Demonstration of x-Rays by Dr. J. C. McMillan. Demonstration on Pathology by Dr. S. J. S. Pierce, Operations at St. Boniface Hospital.

Afternoon session: Demonstration by Drs. Alexander and Mathers at King George Hospital for Infectious Diseases.

1. Three minute explanation of technique of hospital: (a) Nurses lecture course. (b) Method of case recording.

2. Inspection of building to illustrate the practice of the hospital: (a) Admitting rooms and locker rooms. (b) Ward explanation of technique to prevent cross infection. (c) Operating rooms, prepared for mastoidectomy, intubation and tracheotomy. (d) Diphtheria: outline of treatment with special reference to dosage and mode of use of antitoxin, results obtained. (e) Laboratory: exhibit of "T. B." charts showing relation of Arneth blood picture to clinical facts and prognosis.

Evening session: Clinic at Winnipeg General Hospital: Dr. Hugh Mackay, "Squamous syphilide v. psoriasis." Dr. A. J.

Burridge, "Auricular flutter." Dr. R. D. Fletcher, "Gonorrhœal rheumatism." Dr. S. W. Prowse, "Sinus infection." Dr. G. Hiebert, "Tumour of leg." Dr. D. H. McCalman, "Cæsarian section." Dr. William Rogers, "Disseminated sclerosis." Dr. H. P. H. Galloway, "Shoulder case." Dr. J. E. Lehmann, "Fracture of glenoid cavity." Dr. N. J. Maclean, "Ulcer of stomach." Dr. J. Halpenny, "Hernia." Dr. James McKenty, "Jacksonian epilepsy." Dr. E. S. Popham, "Filaria." Dr. D. F. McIntyre, Case of sarcoma of uterus and ovaries treated with Coley's fluid and *x*-ray.

February 19th, Clinic at Children's Hospital: Dr. Raymond Brown, (1) Congenital cataract, needling; (2) Congenital atresia of nostril; (3) Three cases of tonsils and adenoids. Drs. Rorke, Tees and Richardson, (1) Feeding cases, including atrophy, rickets; (2) Congenital syphilis; (3) Double basilar pneumonia; (4) Obstretical paralysis; (5) Cluttons joints; (6) Splenomegaly. Dr. Hughes, (1) Ichthyosis with eczema; (2) Psoriasis. Dr. H. P. Galloway.

Afternoon session: Business meeting of Manitoba Medical Association. Presidential Address by Dr. H. A. Gordon, Portage la Prairie. Dr. Stewart, of Ninette Sanatorium, "Artificial pneumothorax in pulmonary tuberculosis." Dr. A. B. Alexander, of the Municipal Hospitals, opened the discussion.

Evening session, Clinic at St. Boniface Hospital: Dr. Howden, Osteosarcoma of the jaw; Dr. Meindl, Syphilitic osteitis of tibia; Dr. Rice, Cerebral syphilis (two cases); Dr. D. McKenty, Hypopituitarism; Dr. F. D. McKenty, Result of excision of tarsus for trachoma; Dr. Musgrove, Enterostomy for acute obstruction; Dr. James McKenty, (1) Aneurism of the common carotid; (2) Partial colectomy; Dr. Richardson, Double empyema; Dr. Lachance, (1) Atypical amputation of arm; (2) Postoperative hernia; Dr. Mackenzie, Bone-grafting for fracture of arm.

The visit to the new King George Hospital for infectious diseases, which is owned and operated by the city, was very much enjoyed by all those who made the trip. The significance of the Arneth blood picture in relation to clinical facts and prognosis in cases of tuberculosis in the King Edward Hospital (adjoining) was made very evident by Dr. Mathers.

The evening meetings were good, and discussion in some cases was very spirited. On the afternoon of February 19th, Dr. D. A. Stewart, superintendent of the Ninette Sanatorium, gave a most interesting talk on artificial pneumothorax, as it had been practised at Ninette. He was of the opinion that in suitable cases this procedure was of great value. In his Presidential Address, Dr. H. A. Gordon reviewed the advances in medicine and forecasted future advances, especially in the fields of serotherapy and organotherapy.

The election of officers for the year resulted as follows: president, Dr. J. S. Poole, Neepawa; first vice-president, Dr. A. P. MacKinnon, Portage la Prairie; second vice-president, Dr. L. J. Carter, Brandon; secretary, Dr. Ross Mitchell, 702 Boyd Building, Winnipeg; treasurer, Dr. T. Glen Hamilton, Winnipeg; executive committee: Drs. Charles Hunter, Winnipeg; George Clingan, Virden; W. J. Harrington, Dauphin; W. H. Rennie, Portage la Prairie, and T. R. Corbett, Crystal City.

The next meeting will be held in Portage la Prairie in April, 1916.

PRINCE EDWARD ISLAND MEDICAL ASSOCIATION

The mid-winter meeting of the Prince Edward Island Medical Association was held at Charlottetown on Friday, February 19th, under the presidency of Dr. Jardine. The meeting was well attended and among those present were Drs. Alexander McNeill, A. A. McLellan, E. E. Sinclair, and E. T. Tanton, of Summerside; Jenkins, Conroy, Carruthers, Warburton, Yeo, McMillan, Ledwell, Garrison, and Dewar, of Charlottetown; A. A. McDonald, of Souris; F. W. Jardine, of Kensington; W. F. Taylor, of Montague. Dr. Jenkins announced that the provincial government was prepared to fit up the bacteriological and pathological laboratory and that members of the association would be consulted as to the equipment necessary. The thanks of the association were tendered to the government. Among the papers read were "The pathology and cause of diabetes," by Dr. Taylor, and "The sanatorium and its relations to the physician and the public," by Dr. Garrison. Case reports were presented by Drs. Tanton and McLellan. It was resolved that a fee of $1.25 be asked from the members of the association towards the relief fund of the Belgian medical and pharmaceutical professions. Dr. Jenkins was requested to prepare a history of medicine in the province of Prince Edward Island.

TORONTO ACADEMY OF MEDICINE

The surgical section of the Academy of Medicine held its February meeting in the Hospital for Sick Children, with the President of the Academy in the chair. The programme, a clinical one, was provided entirely by the hospital staff, and those who attended were rewarded by a most profitable evening.

Dr. Gallie showed a series of x-ray plates exhibiting various fractures in the neighbourhood of the elbow in children together with some of the patients. Among these he found that sometimes the lower humeral epiphysis was rotated as well as displaced backwards. An epicondyle which has been completely separated will frequently be found on operation to have the fractured surface next the skin.—Dr. Gallie believes that stiffness of the elbow after such fractures is due to improper reduction. His treatment is to put the arm up fully flexed and leave for four or five weeks. The limb is then freed and no attempt made to produce passive motion. The arm is simply let alone as far as the surgeon is concerned and no bad result will follow, provided of course the alignment has been correct. Dr. C. L. Starr emphasized the remarks of Dr. Gallie.

Dr. Alan Brown read notes from eleven cases of congenital hypertrophic stenosis of the pylorus which had been treated in the hospital since July last. Among these the mortality was 40 per cent. but when it is considered that two were moribund at the time of admission and one died six weeks later from enteritis, the real death rate was only 10 per cent. which indeed was a very remarkable showing. All gained weight after the operation, the vomiting being checked in about two weeks. The operative procedure was that of Webber in which the pylorus is hooked into the abdominal wound and incised longitudinally down to the mucosa which bulges into the wound. When the hæmorrhage has been controlled the abdominal incision is closed. There is no shock following such a procedure, which is in marked contrast to gastro-enterostomy. The after-treatment is very important and breast-feeding is practically essential for success. The average weight of these patients before operation was 6 pounds, 6 ounces. Dr. Brown divided the cases into medical and surgical, depending upon the amount of food which could be aspirated from the stomach after a four-hour interval. There can be no doubt about the condition in premature infants. Dr. Brown showed four babies which had been operated upon, two of which were recent cases and still in hospital. Dr. Starr said that before Dr. Brown came the mortality was nearly 100 per cent. from gastro-enterostomy. He gave in detail the operative treatment. Dr. Gallie showed for comparison a cross section of a normal and hypertrophic pylorus, also a cross section of a pylorus which had been longitudinally incised. No fibrous tissue was visible, the hypertrophy being purely smooth muscle.

Dr. Gallie then exhibited a number of x-ray plates showing Pott's disease in early stages. He showed one boy with high dorsal Pott's and low cervical treated with a Minerva jacket. The great advantage of the latter lies in the fact that the lower jaw can be moved, consequently the vertebral column remains fixed. The jacket is kept on for three years, a new one being put on every six months. He also showed a patient with lumbar Pott's whom he had treated by a modified Albee's operation. He had prepared beforehand a piece of bone from an amputation, bored holes corresponding with the lumbar spine and then boiled it. This at operation was splinted to the vertebræ with so far excellent results. Dr. Starr pointed out that Dr. Gallie's method required very careful measurement to get the splint to fit the holes in the plate and suggested cutting a trough in the middle of the splint and fitting it on.

Dr. Starr exhibited a man upon whom he had operated some two years ago for ankylosis of both hips following a pneumococcic infection three years previously. The operations were two months apart and chromicized pig's-bladder was used to cover the part of the femoral neck left after chiselling the part loose. While he did not claim a brilliant result, still the patient was immeasurably improved as he could now walk about and sit with a fair degree of comfort.

Dr. Starr then demonstrated some congenital club foot cases. He pointed out that manipulation should be commenced three weeks after the child was born and the only one capable of doing this was the surgeon. Plaster of Paris was used as a retention apparatus. The manipulation must be done gradually and first the varus must be corrected. One must be sure to over-correct the deformity. After the correction a splint is worn at night for five or six months after the patient is able to walk. He also showed the cast of a man aged thirty-five with double club foot. The foot was tremendously turned in at the neck of the astragalus. What he did was to excise the head and neck of the astragalus and then excise a wedge out of the outer side of the os calcis. In that way no joint was destroyed, an improvement upon the Davies-Colley operation.

Dr. Bruce Robertson explained the Lindeman method of blood transfusion. The syringe is boiled in liquid paraffin and blood is taken from a vein of the donor and injected directly into the recipient. It is best to cut down and expose the veins in each case. If there is any tendency to clotting in the needle it is cleared by saline. He showed a child upon whom he had so operated for hæmophilia, which, however, came back again in two months. The mother's blood was again transfused but with no better result. The house surgeon now volunteered to give some blood, which was attended with better results. Dr. Primrose, who had been asked to discuss the procedure, referred to methods of transfusion which had been used in the past. The Crile method was very difficult and in one of his experiences the radial artery of the donor was atheromatous and could not be utilized. With this method one knew exactly how much blood was being put in while with Crile's this was not the case. All he uses is a syringe with a cannula and connecting piece of rubber tubing. The blood can be very rapidly emptied into the recipient and about seven or eight hundred cubic centimetres is an average dose. Of course, the blood should be tested previously as to aggultination and hæmolysis. He recited a case of pernicious anæmia with a very rapid increase of both hæmoglobin and red cells after a single transfusion. Dr. Powell referred to the fact that Dr. Hodder years ago in Toronto transfused patients to counteract effects of cholera. Dr. H. B. Anderson thought that on account of the frequent sudden changes in the pernicious anæmia blood picture it was not possible to refer such a change to blood transfusion.

Dr. Gallie showed lantern slides illustrative of known fixation for various forms of paralytic club foot and also some patients upon whom he had operated with most gratifying results. He likewise showed some patients with Erb's paralysis or birth palsy. In view of the fact that the nerves are usually only stretched his treatment was to put the arm up abducted with the elbow at right angles to stretch the contracted muscles and at the same time relax the paralyzed ones.

Dr. Starr exhibited some patients illustrating congenital dislocation of the hip and the Lorenz method of treatment. He also showed some fractures of the femur. He found no difficulty in getting the oblique fractures in position by traction, and exhibited the table used for putting on extension. The transverse fractures, however, were the difficult ones and these he had usually to cut down upon. He did not, however, find it necessary to plate them. Dr. Gallie showed a boy with fracture of the femur upon whom he had put a bone plate with bone screws. He also showed slides of a transverse fracture treated by a sliding wedge with parallel sides cut into the medulla. Then the narrow end is partly excised and the wedge driven onwards. [The method is described and illustrated by Dr. Gallie in the JOURNAL, February, 1915.]

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE sixth regular meeting of the society was held Friday evening, December 18th, 1914, Dr. W. F. Hamilton, president, in the chair.

LIVING CASE: True (mirror picture) dextrocardia in situs inversus, illustrated by radio- and electro-cardiographs. By Dr. Maude E. Abbot and Dr. J. C. Meakins.

Dr. Abbott: This patient came under my observation when he was sent to the Medical Building by Dr. Vipond to see if any of the medical teachers wanted to show him to the society. Later I brought him to the Royal Victoria Hospital where Dr. Pirie took *x*-ray plates and Dr. Meakins electro-cardiographs of him. One hundred and twenty-five cases of this condition have been collected from the literature and studied by Kuchenmeister. Complete situs inversus has to be distinguished from a condition in which the heart is on the right side of the body but the remaining viscera are normal. In true situs inversus, which is the condition seen in this patient, all the organs are transposed. The patient is apparently perfectly normal, thirty-seven years of age, and enjoys good health. He entered military service at an early age, served through the Boer War, and it was only during this campaign when he took typhoid fever that his condition was discovered. He had himself diagnosed his own condition, however, some years previously by noting that his heart beat on the right side. Kuchenmeister gives a very good series of diagnostic points in complete situs inversus. As everything is transposed we get all the conditions normally prominent on one side of the body prominent on the other. The measurements of the head and neck are normally larger on the right side, here this is so on the left; the right thorax is usually somewhat larger in circumference than the left, in situs inversus the opposite is the case; also vocal fremitus is here increased on the left side instead of on the right. Coming to the condition of the dorsal vertebræ the curvature is here slightly reversed. Dr. Meakins has very kindly mapped out the percussion dulness of heart, liver and spleen, showing the heart entirely transposed, and the apex beat quite clearly to be made out in the fifth right interspace. The liver is on the left side. These points are confirmed by the *x*-ray plates. An interesting diagnostic point is that the tympany over the cæcum on the left side is very clear as compared to the dulness over the ascending colon and sigmoid flexure on the right. Another point also presented here is that the right testicle, which is normally higher on the right, is higher on the left side. As to left-handedness these cases are sometimes left handed but not invariably so. This patient is not left handed but his muscular strength is better in the left hand; his left foot is also the stronger.

There are two conditions in which the heart is on the right side which have to be differentiated from the dextrocardia of complete situs inversus. One is a congenital defect in which the apex lies to the right and occupies the same position, but the other organs are in their normal situation. Congenital dextrocardia of this type is a totally different condition from that before us, and is usually combined with other cardiac defects, the condition being due here to a true arrest in development; in the heart of these cases we see this difference, that though the apex points to the right it is not formed by the left ventricle (as it is in the case of complete situs inversus before us) but by the right ventricle. There are thus two distinct types of congenital dextrocardia in one of which (situs inversus) the apex is formed by the left ventricle, and in the other (congenital dextrocardia, without situs inversus due to arrest of development) the apex is formed by the right ventricle. There is a third condition in which the heart is found on the right side because it has been pushed over by some pleural condition (dextroversio cordis). We have now the means of diagnosing clinically the dextrocardia of situs inversus from the dextrocardia due to arrest of development and from a simple dextroversio cordis, and that is by the electro-cardiograph.

Dr. Abbot exhibited the *x*-ray plates and lantern slides, illustrating the various types of dextrocardia and Dr. Meakins the cardiograph tracings.

CASE REPORT: Pulmonary embolus following coronary thrombosis, by Dr. J. A. Hutchinson and Dr. L. J. Rhea.

PAPERS: 1. The present status of the bacteriology of Hodgkin's disease, by Dr. L. J. Rhea.

DISCUSSION: Dr. A. E. Vipond: Dr. Rhea's paper is of peculiar interest to me. For the past nine years I have made a study of the glands of the body. About eight years ago I read a paper at the British Medical Association meeting in Toronto, and at that time stated that the lymph nodes were enlarged in all infectious diseases and that the microörganisms peculiar to each infectious disease would be found in the lymph nodes and that the portal of entry was the tonsil. Some years ago I satisfied myself that I had produced scarlet fever in monkeys by inoculating them with a culture of bacilli obtained from the nodes of scarlet fever patients; and further recovered the same bacilli from the nodes of the monkeys who had developed scarlet fever. In regard to the organism which had been obtained from the enlarged glands of patients suffering from Hodgkin's disease two years ago under strict antisepsis I obtained a short bacillus from an enlarged node of a patient who suffered from lymphatic leukæmia. I inoculated a healthy macaccus rhesus monkey with a culture of this bacillus and in twenty-four hours the nodes were swollen, at the end of forty-eight hours he had ecchymosis in the skin and in five to six hours the monkey was dead. Death was likely due to an overdose of the culture. I had a vaccine made for my patient and in twenty-four hours after inoculation the nodes were reduced to half their size and in about ten days' time he returned to his work as an iron moulder. At this time I left home and the treatment was neglected, the patient dying in about six months' time. In a second case I only got cocci from an enlarged node; however, if I had been allowed to persevere I might have obtained the same bacillus.

Dr. J. G. Adami: I admire the cautious way in which Dr. Rhea has brought forward this subject of the etiology of Hodgkin's disease. When a man has succeeded in isolating an organism, as he has done, from a particular disease, it is distinctly hard not to feel some little affection for that organism and not to conclude that it must be the causative microbe. It shows strong powers of self-restraint to speak so cautiously as Dr. Rhea has done. It must, however, be admitted that these diphtheroids are becoming a positive plague; of late years they are constantly turning up, and that in all sorts and conditions. It is but a few years ago that certain bright Edinburgh observers caused a temporary stir by isolating diphtheroid organisms in a series of cases of general paralysis of the insane; one friend, who is now President Wesbrook, of the University of British Columbia, isolated a similar organism from a case of rabies. He was careful to impress upon his readers that he could not regard this as the causative agent. Another Canadian worker, Hamilton Wright, called attention to the presence of the diphtheroid bacillus in the alimentary tract in the early acute tage of beri-beri. Here in connexion with Hodgkin's disease it is certainly more than a little suggestive that this type of organism has been found by so many workers in so many cases. I have for long years accepted the conclusions of members of the Johns Hopkins School that the lymphatic enlargements of this disease are not primarily of the nature of a neoplastic growth, but bear the earmarks of a low form of chronic inflammation. And holding these views I confess I have been prepared to welcome the discovery of a bacterial or other microbic agent. Nay, more, I remember how Duval, here in Montreal, produced a condition in the rabbit which was like Hodgkin's disease, by inoculating animals with an attenuated tubercle bacillus. I was ready to accept those results from the fact that in bovine tuberculosis the bacillus especially affects the lymphoid tissue, producing an extraordinary enlargement of the lymph nodes. It is not a little interesting that attenuated tubercle bacilli grown for a long period in the laboratory take on the characters of diphtheroid bacilli. Thus I have still hopes that this organism of Bunting, Rhea, and others, may eventually be demonstrated to have a causative relationship to the disease.

Lastly, a few words in relationship to productive inflammations. I have, as many here may know, for many years laid stress upon the capacity possessed by bacteria of a low grade of virulence to stimulate cell growth and induce cell multiplication instead of setting up cell destruction. Nay, more, I have laid down that if the irritation be long enough continued, these proliferative cells may take on the habit of growth, and now irrespective of the initial microbic cause, may continue to multiply, in this way setting up a neoplasm. It seems to me that the lymph nodes in Hodgkin's disease afford good examples of both of these stages. In some cases the low inflammatory changes predominate, in others we see undoubtedly that a further stage has been developed, of true sarcomatous development.

2. The bacteriology of puerperal blood, by Dr. J. J. Ower, read by Dr. J. G. Adami, discussed by Drs. Little and Adami.

3. Static joint disease, by Dr. J. Appleton Nutter.

THE seventh regular meeting of the society was held Friday evening, January 8th, 1915, Dr. W. F. Hamilton, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

1. This specimen of a liver which I present herewith is interesting on account of the rarity of the lesion and the very unusual way in which it led to the death of the individual. It is from a middle-aged man, admitted to the hospital late one afternoon with

a tremendous ascites; not much else could be made out. He was tapped that evening and stood it well, but during the night suddenly collapsed, pulse became feeble and he died very shortly after the first symptoms. At autopsy was found, in the first place, in spite of tapping, a very large amount (4 litres) of ascitic fluid, which was deeply hæmorrhagic, so much so that the ascitic fluid looked almost like blood. Investigating the source of that tremendous ascites and hæmorrhage, attention was immediately attracted by the liver which impressed one as a typical hob-nailed liver. It was natural, therefore, to suppose that the fatal hæmorrhage was due to rupture of a varicose vein somewhere into the abdominal cavity. However, that proved wrong for it was found that the under surface of the right lobe of the liver was the seat of a definitely protruding globular tumour mass which on palpation was found so soft as almost to fluctuate. The under surface of this mass was distinctly umbilicated; the centre of this umbilication had become necrotic and perforated. In this way had occurred a hæmorrhage from the liver into the ascitic fluid, a bleeding which was quite sufficient to account for collapse and death. On further investigation the mass was found to be a distinctly circumscribed and necrotic growth occupying a large part of the right lobe of the liver, taking its origin apparently from the liver substance and surrounded by definite fibrous connective tissue which also travelled through the mass. No other growth or metastases were found in the body.

The possibility of a primary carcinoma of the liver was entertained and this proved to be correct. As you know, primary cancer of the liver is of great rarity, most cases take their origin, as this one, on the basis of a cirrhosis and often from the nodular hypoplasias which occur in cirrhosis of the liver. They also display, as this tumour did, tendency to necrosis and penetrate into veins and ducts, but very rarely soften at the outside with perforation and fatal hæmorrhage into the abdominal cavity. There was in addition a very large spleen quite typical of one usually found in liver cirrhosis.

2. In the second case I have no organs to show, only some slides of the condition, which is rather interesting. It concerns a young man, an athlete of thirty-five years of age, who seemed in perfect health, was married and had healthy children. He had been examined by a life insurance physician a year ago and had been recommended and accepted as a splendid risk. He went on the night of his death to a rather exciting wrestling match and during the heat of the match, while shouting, he was seen to grow pale and dropped;

in less than twenty minutes he was dead. The coroner issued a certificate of heart failure but the insurance company not being satisfied with that demanded a post-mortem. This was done but, unfortunately, after the body had been injected and late at night. At the time of the autopsy I found nothing grossly, although particular attention was paid to the circulatory system—possibility of status lymphaticus, etc. Everything appeared that night in perfect shape, but I took the heart with me and made sections of it because the whole history of the case and negative gross findings pointed to the possibility of heart block. Microscopic examination showed that the man had a very marked fibrous myocarditis, particularly in the interventricular septum of the heart. Fibrillar non-cellular tissue had replaced much musculature. It was interesting to get some facts in the history later which threw some light on this case. We found that the physician who examined him for insurance had made a note that *there was slight irregularity of the heart's action.* However, this is so frequent that no attention was paid to it, but the week before the fatal accident the patient and his wife had attended a similar wrestling match and during the excitement of that match he had fainted but had regained consciousness. In other words he had at the time probably a partial heart block from which he recovered, but at the last attack there was no recovery. It may, I think, be reasonably supposed that the man had gone through some infectious disease earlier in his life, possibly diphtheria—which as you know is extremely liable to leave some heart affection, though, fortunately, in the majority of cases this does not involve absolutely vital parts of the heart. In this case the location was particularly unfortunate in taking up that musculature of the heart which is essential for the conduct of motor impulses. Dr. Oertel showed the microscopical sections of the fibrosis through the musculature.

CASE REPORTS: 1. Portal thrombosis in typhoid fever, by Dr. J. A. C. Tull and Dr. E. W. Archibald.

DISCUSSION: Dr. A. E. Garrow: I would like to ask if Dr. Archibald lined his glass tubes with any preparation of paraffin before inserting them to prevent coagulation and blockage.

Dr. E. W. Archibald: It did not occur to me that it would be necessary with ascitic fluid. One tube stayed perfectly smooth and clean for three months.

2. Stab wound of the liver, by Dr. F. T. Tees.

PAPER: The so-called backward displacements of the uterus, by Dr. W. W. Chipman.

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Annual Meeting, Vancouver, B.C., 1915, postponed.

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Annual Meeting, Peterborough, May, 1915.

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Annual meeting, Moose Jaw, July 27th, 1915

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The Canadian
Medical Association Journal

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PRESIDENTIAL ADDRESS

By D. J. Gibb Wishart, M.D.

Toronto.

THIS gathering to-night in the city of Peterborough marks an epoch in the history of our branch of the Canadian Medical Association, in that for the first time in our history, we have elected to hold our sessions in one of the smaller centres. The burden thus thrown upon a comparative few of our medical brethren has been, as you will agree from the welcome you have already received, most loyally shouldered, and the experiment has become a complete success. On your behalf, I beg to thank Dr. Cameron and the members of the Peterborough Medical Society for their hard, resolute, and unfailing labour in the preparation involved for our gathering here this week.

For the first time, too, we meet in conjunction with the Provincial Officers of Health, and I trust that the result of this union of effort will be followed up by a continuation of these combined meetings. It will benefit both associations. United we stand, divided we might fall.

Before proceeding to the subject proper of my address this evening, I must beg your forbearance while I refer to several matters of common interest to us as professional brethren.

We are, as a nation, in the midst of a great war, and we, as a profession, have risen to the emergency in Canada, and therefore naturally in the province of Ontario.

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*Delivered to the members of the Ontario Medical Association, May 26th, 1915.

"Remember when those tales you read
Of rude but honest 'Canayen,'
That Joliet, La Verandrye,
La Salle, Marquette, and Hennepin,
Were all true 'Canayen' themselves—
And in their veins the same red stream
The conquering blood of Normandy
Flowed strong, and gave America
Coureurs du bois and *voyageurs*
Whose trail extends from sea to sea."

It is a matter of pride to be able to state that thus far we have provided:

1. A Base Hospital, No. 4, from the University of Toronto, of one thousand and forty beds, a staff of thirty-five physicians and surgeons, and twenty medical students in the rank and file.

2. A Casualty Clearing Hospital, No. 2, with a staff of physicians and surgeons, and over thirty-nine medical students and young graduates in the rank and file

3. Two further hospitals have been offered to the Government, one by the Western University, and the second by the Medical Society of the city in which we are meeting now. The handsome offer of the Peterborough Medical Society, which numbers twenty-five all told, was to furnish a Stationary Hospital with medical staff, thirty-five nurses and rank and file, together with the needful supplement of the government issue in the way of initial supplies, and in addition, to guarantee $350.00 per month until the close of the war, to be used for comforts and necessities for the men. It will be difficult to find an equal of this offer, and you will agree with me that the Peterborough medical men are a force to be reckoned with. Congratulations to the Medical Society of Peterborough!

4. Over forty medical officers have accompanied regiments and field ambulances, etc., and many more are awaiting orders. Not a few of our brethren are enrolled in the combative ranks, and some of these have already shed their blood for our liberties. In No. 1 General Hospital, under the command of the last president of the Canadian Medical Association, our genial Dr. Murray MacLaren of St. John, there were four officers from Ontario, and in No. 2 General Hospital, fourteen. In reply to a request from the British War Office for Canadian medical men, offering to give them temporary commissions in the Royal Army Medical Corps, over one hundred and twenty-five responded from Ontario, and thirty-five of these are now on their way to their posts of duty

In addition to this long roll, training units were established in each of our provincial universities, in which our students of medicine were not behindhand in enrolling. It has been impossible for me to obtain the exact figures, but in the Western University, one hundred and sixty students were in training. Queen's has sent with the Army Medical Corps, First Contingent, three doctors and seven undergraduates; with the Duchess of Connaught's Hospital at Cliveden, twenty-one graduates and nine undergraduates; and these are additional to the large body of students who took the Officers Training Corps drill. In Toronto, there were over eighteen hundred students in the Officers Training Corps, of whom four hundred and fifty were from the Faculty of Medicine. Long after the war has ended, and God grant it may be soon, the effect of the self-sacrifice exhibited by the practitioners and students of medicine in leaving wives, children and lucrative practices, or in abandoning a course of study attained after years of effort, just when the goal came into view, will continue to clarify our vision, and give us a truer perspective. We are reminded of the words of our Master, "but I am in the midst of you as he that serveth." Noblesse oblige.

The Germans may at least indirectly be credited with one good deed, in that, owing to the necessity which arose last September that holders of the licence of the College of Physicians and Surgeons of Ontario should proceed with the Canadian forces to the British Isles, and later to the Continent, and thus work under the War Office, it became obligatory upon the part of our Provincial Council to take the necessary steps to establish medical reciprocity with Great Britain. The Council passed the enabling legislation on the 22nd of December last, and when the Ontario House rose at Easter, the Lieutenant-Governor gave the Royal assent to the Ontario Medical Amendment Act, 1915. A doctor holding a qualification to practise in Britain may now register in Ontario, and vice versa. Thus Ontario is now in line with the provinces of Prince Edward Island, Nova Scotia, New Brunswick and Quebec, and a step forward has been taken in regard to the creation of one professional standard for the British Empire. Those gentlemen who drew up the provisions of the Act of British North America and brought into being our Dominion of Canada, may have acted wisely in leaving the control of education to the respective provinces, but should, in the light of subsequent events, have excepted the profession of medicine. We have long laboured under the yoke then placed upon our necks, and every step in the process of release must be hailed with triumph, for we belong to a profession which is bound only by the inadequacy of the human mind to comprehend the height and depth and breadth of the states of health and disease. As Osler writes, "A man who presents evidence of proper training, who is a registered practitioner in his own country, and who brings credentials of good standing at the time of departure, should be welcomed as a brother, treated as such in any country, and registered upon payment of the usual fee." And again, "Medicine is the only world-wide profession, following everywhere the same methods, actuated by the same ambitions, and pursuing the same ends. This homogeneity, its most characteristic feature, is not shared by the law, and not by the church, certainly not in the same degree. While in antiquity the law rivals medicine, there is not in it that extraordinary solidarity which makes the physician at home in any country, in any place where two or three sons of men are gathered together. Similar in its high aims and in the devotion of its officers, the Christian Church, widespread as it is, and saturated with the humanitarian instincts of its Founder, yet lacks that catholicity,—urbi et orbi,—which enables the physician to practise the same art amid the same surroundings in every country of the earth. There is a unity, too, in its aims—the prevention of diseases by discovering their causes, and the cure and relief of sickness and suffering. In a little more than a century, a united profession, working in many lands, has done more for the race than has ever been accomplished by any body of men before."

In the *British Medical Journal* of November 21st, last, there was published an article by Prof. C. Jacobs, of the University of Brussels, in which in few, yet pregnant, sentences he drew a picture of the hideous sufferings into which the cruelty of Germany had plunged our Belgian confrères in medicine and pharmacy. At least one fifth of these two professions had been reduced to abject poverty. Of these, says Prof. Jacobs, "many of them, victims of a barbarian foe, are homeless, deprived of their laboratories, instruments, and their medical stores. What will become of those that still remain of our people, threatened as they are by the grim havoc of war and by contagious diseases, its constant followers? I have witnessed such misery amongst them. Some have had to work as navvies in order to have a few pence in their pockets; others have told me that they have not seen bread for a fortnight, but had lived exclusively on potatoes. Others had a meagre bunch of straw laid on the bare ground as a bedstead; the only pair of boots owned by one of them was falling to pieces in tatters. Men I have seen were dressed in torn garments and their children were in rags. One of my colleagues had to live on wayside herbs for three days and three nights and his wife shared his fate. A professor of a university, bereft of everything, was, when I saw him, in dire want of a bed, and another of equal academic standard was wandering haggard over the countryside searching in vain for a beloved family. And some of our ranks have been taken as hostages, others have been shot, and their widows and orphans have been deprived of everything."

This appeal to our sympathies, at once brought about in Britain the foundation of a most representative committee, under the chairmanship of Sir Rickman J. Godlee, who visited this country in 1913, and upon his request a committee for Canada was shortly afterwards formed, consisting of the leading representatives of the profession in every province. I am happy to state that the response from our brethren throughout the length and breadth of the Dominion has been most enthusiastic, prompt, and self-sacrificing, and that the cash in hand to date amounts to the handsome sum of $7,622.00, of which Ontario has contributed $4,919.00. In addition to this, the sum of $2,600.00 was forwarded by a French committee in Montreal, so that the total for Canada amounts to $10,222.00. From the *British Medical Journal* of the 24th of April, we learn that the British committee to whose care the Canadian committee has remitted to date the sum of $6,916.00, reports that £964 10s. had been forwarded to Belgium to meet the urgent needs of Belgian doctors and pharmacists remaining in their own country, while a further sum of £350 had been devoted to the purchase of drugs and clothes, and by way of loans. The total sum received by the British committee according to the same authority amounts to £10,012 11s. 2d.

While we are pleased at the results attained, we must remind ourselves that if poor Belgium has passed through the fire already, its furnace of suffering will be heated yet again seven times, in the slow and awful torture which must be inflicted upon its cities and citizens during the process of the expulsion of the ruthless foe.

As Professor Sarolea has stated in his Toronto addresses, so full of soul anguish, and yet so resolute, Belgium is between the upper and nether millstones, and will be ground to dust. The need for help will outlast the war, and neither must our purse strings be drawn, nor our sympathies dried up, until our professional brethren in Belgium are once more reinstated. "When the day comes for the nations to adjust the balance, and right the wrongs which Belgium has suffered, one of the first duties of the medical profession throughout the world will be to see that the practitioners who have played so distinguished and useful a part in the life of their country are reinstated. We cannot at once rebuild the houses of Belgian doctors, or restock the shelves of Belgian pharmacists, but it is clear that the people require prompt medical attention, and it is a debt of honour to try and meet the immediate necessities of their doctors and pharmacists."

To-morrow afternoon there will be placed before you for consideration the results of the labours of Dr. Wallace's committee upon affiliation with the county and town medical societies. I trust that you will decide to accept the recommendations offered.

Were admission to the county and town society, within whose borders a physician practices, made the one portal of entrance to the provincial body, and through the latter to the Dominion Association, all doubt would be removed as to the eligibility of the candidate. He would literally be judged by his peers, a truly British method. On the other hand, the impossibility of obtaining admission to the Dominion or provincial body, if refused by the local society, would serve to regulate the steps of the beginner in practice. It is in the smaller towns and country districts that conditions are most favourable for mutual misunderstandings. Only those who have been brought up in such surroundings can appreciate how hard it is for physicians to keep on good terms with one another. The practice of medicine calls equally for the exercise of the heart and the head.

The association of all the physicians of a district in a society where they may frequently meet with one another, and so learn to value the good points, and excuse the bad points of their confrères, will do much to unite the profession in this province, and prevent misunderstandings. These beneficial results are obvious, and extremely valuable, but there is another end to be gained from the scheme proposed, an end to which no real approach has ever been made by our Canadian profession hitherto, namely, the enrollment of every member of the profession in an organized whole, which may speak with the authority consequent upon its composition, upon any matter which affects its welfare, or that of the health of the public. At present, associations and societies may only speak for their respective members, and a government may decide to consider these non-representative; whereas there are many questions, the solution of which cannot be properly secured without the aid of our profession. Assemblies, conferences and synods speak for every member of the various religious bodies, and the benchers for the lawyers, but our profession has no united voice, nor will it have until each practitioner be enrolled in a common membership of a common body, and recognise that he belongs to a guild, the interests of which are incompatible with all professional bitterness, all rancour, or personal hostility. The brethren must dwell together in unity.

The attention of the representatives in both houses of Parliament should be directed by our members to the Act for the curtailment of the sale of habit-forming drugs,—opium, heroin, codeine, cocaine and morphia—which was enacted in Washington recently. The above-mentioned drugs, together with all like preparations, are withdrawn from sale except under very restrictive conditions, which, if carried out in the spirit of the Act, will tend to minimize the evil, if not to wipe it out altogether

"No person or company may sell one of these articles, except under licence of the Bureau of Internal Revenue. The consumer of the dangerous drugs must present either a prescription or an order written by himself, for the drug in question, which order calls for a full description of the purchaser, including age, colour of eyes, occupation, etc., and is later examined and reported upon by a government inspector. The sale of the drugs, in fact, is made so irksome to both parties in it, that it is expected that the drug victim, or the possible drug victim, will shrink from the red tape and the prospect of exposure which the law has provided for drug buyers and users." It is stated that the result of the passage of this law already is that every institution for the treatment of the victims of the drug habit is crowded with patients who would rather be freed from its curse, than attempt to satisfy their cravings under the difficulties provided by the Act. Our own laws in regard to the sale of similar drugs may be improved with advantage to the inhabitants of Canada, and the results of the passage of this act in the United States should be carefully noticed, with this in view. I trust that you will individually keep your member posted so that a further important step in preventive medicine may be gained.

The subject which I have chosen as the main topic of this year's Presidential Address is "The Evolution of the Specialist in Oto-Laryngology," yet what I have to say will apply equally perhaps to any of the so-called specialties. The subject conveniently arranges itself under four heads; (*a*) The definition of a specialist; (*b*) The need for his existence; (*c*) The training required; (*d*) The nature of his relationship to the general practitioner.

In developing this subject, I shall require to use some plain speech, because between the degrading, but alluring effect of the establishment of certain polyclinics or postgraduate schools, where, to quote the Carnegie Report, "the training is of a practical, not of a fundamental, or intensive kind," "calculated to 'teach the trick,' or perhaps better to exhibit an instructor in the art of doing it," and on the other hand, the desire of the wearied practitioner to get into something "easy", this country is threatened with becoming burdened by a load of ill-trained specialists.

Believing that, in the words of Oliver Wendell Holmes, "fear of open discussion implies feebleness of inward conviction, and great sensitiveness to the expression of individual opinion is a mark of weakness," and disclaiming all intention to offend, I invite your attention and forbearance.

A specialist has been defined as "one who knows as much about all parts of his subject as any, and more about one part of it than any other," but I would paraphrase this definition and bring out its meaning more fully. A specialist is one who, *after* completing the usual time of medical study, and obtaining his degree, pursues a further course of instruction over a number of years, in some limited field, and abandoning the practice of every other branch of medicine, confines himself solely to that branch in which he has thus become qualified to speak with authority. No one has a right to pose as a specialist who has not proved his title to do so by such a prolonged course of special study, and let me remind you that the cards which some of our members permit to appear in the advertising columns of the newspapers reading somewhat as follows: "Dr. ———, Physician and Surgeon; Graduate of the ——— University; Licentiate of the College of Physicians and Surgeons of Ontario (as if he could practice at all without this). Special attention given to Diseases of the Eye, Ear, Nose and Throat," are strictly unethical, according to the code of this Association, and in my personal opinion, beneath contempt.

The backbone of our profession is the general practitioner. As Osler writes, "There never was a time in our history in which he was so prosperous, so much in evidence, in which his prospects were so good or his power in the community so potent. He still does the work, that great mass of routine practice which brings the doctor into every household in the land, and makes him, not alone the adviser, but the valued friend. He is the standard by which we are all measured. What he is, we are; and the estimate of the profession in the eyes of the public is their estimate of him. A well-trained sensible doctor is one of the most valuable assets in a community, worth to-day, as in Homer's time, many another man. To make him efficient is our highest ambition as teachers; to save him from evil should be our constant care as a guild."

But medicine advances by leaps and bounds, and it is absolutely impossible for one brain to compass the length and breadth of medical knowledge. Nor is it reasonable that the man just graduated should be expected to be equipped with a full knowledge of medicine, embracing all the newest procedures, and ultimate tests in every specialty. If this were demanded, the curriculum of the medical course would be stretched out by many years, and the task of entering upon the practice of the healing art, already difficult enough, would be made impossible for the average man or woman. In addition, the pecuniary results to be obtained afterwards would not be worth the investment of time and money. Our licence to practice does not even yet demand that the graduate be able to recognize a membrana tympani. The hearing of a few lectures will not teach him this. In the Universities of McGill and Toronto, it is only very recently that the course has been made clinical, instead of didactic.

The public is both ignorant and superstitious; they have been accustomed to think that the letters M.B., of M.D., C.M., mean that the owner of these mystical characters is possessed of a complete knowledge of all things medical. On the other hand, you know and I know, that we are vastly ignorant, and that medicine is far from an exact science, and therefore we should strongly combat this wrong opinion on the part of the general public.

Reason is there, and the very best, that men should specialise, should fit themselves to know all there is to know upon some one of the various branches of the healing art.

The specialist exists to give assistance to his brethren, the general practitioners, not to enter into competition with them in any shape or form.

But if the specialist exists for the assistance of the general practitioner, I would have the latter fixed in his determination to demand high qualifications of those whom he calls upon for such assistance. What should those qualifications be?

1. An excellent general preliminary education, including a knowledge of the more important modern languages, an indispensable accomplishment for one who must follow the international literature of the day.

2. A postgraduate position as hospital intern, preferably in medicine, but better still in both medicine and surgery.

3. A year or more in general practice, during which he may try himself out, and when he chooses his specialty, choose wisely.

4. If the choice be Oto-Laryngology, then must there follow an internship of at least eighteen months, devoted exclusively to the special subjects where he will toil daily with patients in a special clinic, mastering the details of examination and diagnosis, and be trained under a master eye in the technique of operations.

5. Lastly, he must place a coping stone of a further year at some university where he will obtain postgraduate instruction upon;

(1) Clinical diagnosis and treatment.

(2) Functional tests especially.

(3) Bedside work on surgical cases.

(4) Surgical practice on the cadaver.

(5) Practical treatment and minor operations in the out-patients' ward.

(6) Demonstrations and lectures on normal and pathological anatomy, histology and physiology.

(7) Diagnosis and pathology of labyrinth diseases.

When finally he seeks the suffrage of his fellows of the general profession, he must become attached to a hospital where he can maintain his contact with a public clinic, for otherwise he can never hope to advance, or even to keep abreast of his subject.

I have given you above the qualifications demanded by the American Laryngological, Rhinological and Otological Society, and also of the hospital where I have the honour to control the Oto-Laryngological service.

Am I too ambitious in making these demands? No! If we, as specialists, are to deserve the respect of our confrères, we can demand no less.

Unfortunately, although specialism, with its implicit claim of superior skill in one direction, is now recognised as both efficient and useful, it remains on a very informal basis, and few universities are yet equipped to give adequate preparation for specialising, but a better day is dawning, and this function will be recognised by the universities, and indeed specialisation will not be allowed without such university postgraduate training.

As the Carnegie Report says, "Improved medical education will undoubtedly cut the ground from under the independent postgraduate school as we know it. This is not to say that the undergraduate medical curriculum will exhaust the field; on the contrary, the undergraduate school curriculum will do only the elementary work; but that it will do, not needing subsequent and more elementary instruction to patch it up. Graduate instruction will be advanced and intensive, the natural prolongation of the elective courses now coming into vogue. For productive investigation and intensive instruction, the medical school will use its own teaching hospital and laboratories; for the elaboration of really thorough training in specialties resting on a solid undergraduate education, it may use the great municipal hospitals of the larger cities. But advanced instruction along these lines will not thrive in isolation. It will be but the upper storey of a university department of medicine. The postgraduate schools of the better type can hasten this evolution by incorporating themselves in accessible universities, taking up university ideals, and submitting to reorganization on university lines."

The truth is, we have too many so-called specialists, the damaged fruit of commercial postgraduate colleges, managed by a board of stockholders for the sake of the almighty dollar. The unfinished product of these institutions has resulted in the establishment of a class of mediocre specialists, who often bring discredit upon the whole institution of specialism. To quote from a recent writer in the *New York Medical Journal*, "The true specialist can never afford to stop working scientifically. The continued wave of progress in medicine must be closely followed by him, lest he remain behind. In his practice the true specialist should be before all, a reliable diagnostician. Acquaintance with the commoner diseases of any organ may safely be expected of any well-trained and fairly experienced general physician. But we have a right to demand from the specialist thorough and easy familiarity with rare and exotic affections also; in other words, in his rôle of consultant, he should be an expert. Likewise he should be fully at home in all therapeutic methods pertaining to his specialty." "Whereas to the mediocre specialist his specialty is nothing more than a milch cow. Such a man probably enters the medical college with a firm determination of eventually 'making a specialty' of a certain class of diseases. While in college he considers everything which is not directly related to his prospective fields as irrelevant, gets through his medical course easily, about well enough barely to pass his examinations without being plucked. His sheepskin still damp from the signatures of the faculty members, he at once goes abroad for special studies, to Paris, London, Vienna. These studies are largely devoted to a minute investigation of the most famous cafés, restaurants, theatres and other places of amusement; a few special courses by privatdocents or assistants, given in a poorly understood foreign language, are, however, usually taken along by the way, as it were. Six or twelve months later he arrives home, where his friends have already been prepared by numerous letters of his wonderful attainments abroad, armed with instruments of the latest pattern, declaiming about the very most recent methods of treatment of which he is now the only possessor, and superciliously sneering at old-fogeyish Dr. X whose competitor he starts out to become."

The nature of the relationship of the specialist to the general practitioner must be considered from opposite sides. The specialist must remember that he is dependent for his practice upon the general practitioner, and that his advice is sought for the purpose of a skilled diagnosis in determining the line of treatment, which often may be carried out fully by the family doctor. He is to be the ally, not the competitor, ever ready to support, and never willing to supplant. It is up to him, in association with the pathologist, the physiologist and the clinician, to do the bulk of the real work in the science and art of medicine.

On his side the general practitioner should make free use of the specialist. Is he to refer all cases in Oto-Laryngology to the specialist? No. But it is wrong for him to fail to do so, when he cannot fairly claim that he possesses the requisite knowledge of the conditions before him, which will enable him to serve the best interests of his patient. His conscience should tell him whether he has arrived at the point where his patient should have the benefit of a knowledge beyond his own. If this point is reached, failure to employ this extra knowledge is nothing short of criminal. If he is absolutely steadfast in calling to his aid every possible means of securing the best interests of his patient, he will surely and steadily build up for himself a reputation for reliability and carefulness, which will establish his high standing in the community, and give him the priceless possession of a conscience void of offence toward all men.

To do the opposite is to descend to the commercial basis of the public, the results of which are seen in the deplorable editorial attitude of many of our leading newspapers towards all things medical, in the scepticism of the legislature to the altruistic intentions of the profession as a body, and in the too widespread opinion among the general public, that the physician is not sincere in the promotion of measures which might prejudicially affect his pocket, because it would not be "business."

As Osler puts it, "Faith is the great lever of life; without it man can do nothing; with it, even with a fragment as a grain of mustard-seed, all things are possible to him. Faith in us, faith in our drugs and methods, is the great stock-in-trade of the profession." "To wrest from Nature the secrets which have perplexed philosophers in all ages, to track to their sources the causes of disease, to correlate the vast stores of knowledge, that they may be quickly available for the prevention and cure of disease, these are our ambitions."

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PROPHYLACTIC INOCULATION AGAINST TYPHOID FEVER IN THE FOURTH MILITIA DIVISIONAL AREA OF CANADA*

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AND

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THE efficiency of an army in the field to-day depends largely upon the factors that have made armies efficient in the past,—training, generalship, equipment, and the physical condition of the troops. The constant developments that have taken place along each of these lines have in most instances been gradual, though at times they have been almost miraculously sudden. This is especially true of certain aspects of the medical sciences. These developments have come with specialization in the arts and sciences of war; a specialization in those scientifically proven measures which adapt themselves to the peculiar demands of a force that must at all times be mobile.

In this specialization medicine, in the broad sense of the word, has received most careful consideration. The medical interest in the fighting man has gradually broadened from that of the earlier days, when only those wounded or ill in camps were cared for, to an interest which in its scope deals with the recruit from the time of his enlistment and even with his family before him, all through his military career, and with his remains when he has paid the toll of war. This interest can in no sense be looked upon as a narrow interest. It is an interest as broad as medicine itself, and commands the best thought and the best energy of the best men in all of its branches.

Military authorities early realized the practical benefits to be derived from the application of the truths learned by the study of hygiene and preventive medicine, and have in general, so far as is possible and practicable, adapted these measures to their fighting forces. The practical application of this comparatively recently developed science has added most substantially to the efficiency of armies and has developed a feeling of security among officers and men that counts for increased efficiency. The successful operation of those preventive measures that are applied to armies in the field to-day may play an important part in the final outcome of the present war. They might even determine it. Uncontrolled epidemics of certain diseases might take a heavier toll than shrapnel and rifle bullets. For this reason the preventive measures that to-day are so scrupulously enforced by the military authorities mean, when analyzed, a practical demonstration on a large scale of the chief principles of preventive medicine and hygiene. To a particular phase of one branch of preventive medicine—prophylactic inoculation against typhoid fever—we wish to refer in some detail.

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* From the Pathological Laboratory of the Montreal General Hospital.

It is not necessary that we review the convincing statistics that have been published by army officers of Great Britain and the United States, nor is it necessary to go into the history of antityphoid inoculation. It is well known to all. But it has had its difficulties. These difficulties have gradually been surmounted until to-day an army unprotected against typhoid fever is an army whose efficiency, however great to-day, may be materially diminished to-morrow. The Militia Department of Canada early realized this and antityphoid inoculation in the Canadian Expeditionary Force has kept pace with recruiting.

In one militia divisional area we have had some part in this fight against typhoid fever, and wish here to record some of the data in regard to it.

One of us, anticipating its possible need in the present great war, obtained last summer a culture of *B. typhosus* from Sir William Leishman's laboratory in London. This was a transplant from the same culture used by him in the preparation of anti-typhoid vaccine for the British Army and by the United States Army in the preparation of the vaccine used by them—a culture selected chiefly for the reason that its efficiency in terms of protective reaction on the part of the body is high, and the symptoms following its inoculation are slight.

In the preparation of the vaccine made by us we have grown the organisms in bulk, on plain agar corrected to 1·5 per cent. acid to phenolphthalein. The agar is made stiff, 2·4 per cent., put into Blake bottles, slanted, and allowed to cool. By using an agar of this percentage the organisms may be easily removed from the medium without tearing pieces of the medium off. The use of agar slants as made above has the advantage that accidental contaminations are more easily recognized than when the organisms are grown in some fluid medium, and the possible objection to injecting peptone-containing fluid avoided. After the Blake bottles have been inoculated and allowed to remain in the incubator at 37° C. for eighteen hours, they are removed and there is added to each of them 5 c.c. of sterile normal salt solution. By means of a properly bent platinum needle the surface growth is easily scraped off and mixed in the salt solution at the bottom of the bottle. The mixture is then transferred by means of a sterile pipette to a sterile culture tube which has been drawn out in its upper third. This tube is now sealed in the flame and placed in a vaccine shaker for fifteen minutes, when the colonies and clumps of organisms are thoroughly broken up. All except 2 c.c. of this mixture, which is kept for bacteriological examination, is added to a flask containing a known quantity of sterile normal salt solution, and thoroughly mixed. The amount of sterile normal salt solution used is optional. We have used a known quantity in order that we might calculate the number of cubic centimetres of finished product that it was necessary to be prepared for. As the amount of vaccine made at one time has, as a rule, been five litres, the amount of sterile salt solution to which the mixture of organisms is added, has been 500 c.c. We have used 500 c.c. as this amount is easy to handle.

In order that the bacterial count of this mixture may be exact, before the original bacterial mixture is added to the sterile salt solution, there is removed from it as many cubic centimetres as there are cubic centimetres of bacterial mixture. This mixture contains far too many organisms to be used as it is, but it is easy to apply heat to this amount, and from it the final dilutions are readily made.

The number of organisms per cubic centimetre of this mixture is now determined. We have done this by means of a specially made counting chamber, as in our hands this method is more accurate than the others we have tried.

The two cubic centimetres left in the culture tube containing the original bacterial mixture is taken for bacteriological examination in order that one may be sure that the culture used is a pure culture.

The method we have employed for killing organisms is as follows. The flask containing the bacterial mixture is placed in a water bath with heat regulated so that the temperature of the mixture within the flask is kept at 54° C. This is made easy and accurate by putting into a second flask, of the same size and shape as the one containing the bacterial mixture, as many cubic centimetres of normal salt solution as there are cubic centimetres of fluid within the flask containing the bacteria. A thermometer is passed through the cork in the flask containing the normal salt solution and extended down into the central portion of its contents. This control flask and the one containing the bacterial mixture are fastened side by side in a wire basket which is lowered into the water bath so that the water in the bath comes well above the fluid in the flasks. If the flasks are gently shaken while in the bath, the heat from the water in which they are placed is more uniformly transmitted to the fluids within them. The fluids in the flasks are kept at 54° C. for 45 minutes, when the flasks are removed and allowed to cool. Previous to heating the bacterial mixture, 500 c.c. of normal sodium chloride is placed in each of a number of flasks. These are sterilized in the autoclave and to each of them 0·25 per cent. of carbolic acid is added. The flasks are thoroughly shaken in order that the carbolic acid may be uniformly distributed. As the number of organisms per cubic centimetre in the flask which has been heated is known, it is easy to estimate the number of cubic centimetres of the heated bacterial mixture that it is necessary to add to each flask containing the carbolized normal salt solution in order to bring its bacterial content up to 1,000 million organisms per cubic centimetre. Before the correct number of cubic centimetres of the bacillary emulsion is added, an equal amount of fluid is removed from each flask. A few cubic centimetres of the fluid containing the organisms, to which heat has been applied, is again tested bacteriologically. Both ærobic and anærobic cultures are made.

The completed vaccine may be put into containers at once or stored in the flasks in bulk. Whether it is to be bottled or kept in bulk to be bottled later, a final bacteriological examination is made after it has been in its final containers for three days. Besides making ærobic and anærobic cultures we have examined for *Bacillus tetanus*. We have never found contaminating organisms but once, when *B. subtilis* developed on one of the agar slants. It was readily recognized and the Blake flask in which it grew was discarded. We feel that repeated bacteriological examinations should always be made in order that every possible precaution may be taken to ensure the sterility of the finished product. It has been our rule that none of the vaccine is to be used before three weeks, or after four months, from the date of its preparation. An antityphoid vaccine at or beyond three weeks after its preparation seems to be more efficient than a freshly prepared one.

Antityphoid inoculation is not absolutely compulsory in the Canadian Expeditionary Force; the men are told of its advantages and are strongly advised to avail themselves of the protection it offers. Insofar as we are able to learn, not a single individual of the Fourth Militia Divisional Area under the direct control of the A.A.D.M.S. has persistently refused to receive his inoculation.

The method of handling troops and the technique used in giving the inoculation, as practised by Major Muckleston and Captain McKim, have been as follows: when a body of troops is brought up for inoculation, they are carefully and plainly told of its advantages and are also as carefully told of the symptoms which are to be anticipated. No one is inoculated who is in any sense ill; acute rhinitis and the recent extraction of teeth have in a number of instances postponed the administration of the vaccine. The officer in command of the men inoculated is instructed to relieve them from duty for forty-eight hours and the inoculated men are given careful instructions in regard to their duty to themselves. They are to go to their homes or barracks at once, abstain absolutely from alcoholic drinks, take no violent exercise, and go early to bed.

The method of handling troops in large numbers is important. Where large bodies of men are to be handled, time must be considered but not at the expense of safety and accuracy. Discomfort to the individual, however slight, must be carefully considered.

The men are lined up in single file with arms bared to the shoulder. An area on the arm 10 cm. in diameter is painted with iodine, and precautions are taken to prevent touching this spot. 5 c.c. Record syringes with a number of needles are sterilized by boiling. Where bottles are used as containers for the vaccine, their caps are sterilized with alcohol or carbolic, and absorbent cotton soaked in the solution used is kept over them. The hypodermic needle attached to the syringe is plunged through the cap and the syringe filled. By using a 5 c.c. syringe time is saved, as ten first inoculations or five second inoculations can be made from one syringe full. After each inoculation the needle is removed and another sterilized needle is attached by means of sterile forceps.

The site of inoculation has in all cases been the arm, about 10 cm. directly above the external condyle of the humerus. In right-handed men the left arm is used; in left-handed men the right. This point is selected for the reason that it is not too close to the large nerve trunks and large blood vessels. The injection is made subcutaneously; never into the muscle, as muscular injections are more painful than subcutaneous ones and for this reason interfere too much with the movements of the arm.

In most instances two inoculations, ten days apart, have been given. At the first, one-half c.c or 500 million dead organisms are injected; at the second, one cc. or 1,000 million organisms. In a few instances the more ideal procedure of three inoculations has been employed. This has applied to certain individuals and to two units, those commanded by Col. H. S. Birkett and Lieut-Col. R. P. Campbell.

The reaction following the inoculation has been carefully watched by Major Muckleston, A.M.C., and Captain McKim, A.M.C., whom we thank for the data collected by them. The reactions have varied greatly. They may be divided into two groups, local and general. Both of these have varied within comparatively wide limits.

The milder local reactions consist of slight swelling and redness with slight tenderness about the point of inoculation. The more severe local reactions are characterized by swelling and redness of greater extent. In a few instances these have extended throughout the greater extent of the surface of the arm into which the injection was made. The pain likewise varied but in no instance has it been severe.

A most careful watch has been kept for infection at the site of inoculation. In no case has there been the slightest evidence of it.

The constitutional symptoms have likewise varied within wide limits. In most cases there is a feeling of depression within the first five hours after inoculation. Frequently this has been accompanied by headache, general malaise and pains in the joints. Several individuals who had had typhoid fever a number of years previous to their inoculation had pain in the joints, which they insisted was of the same character as that experienced during the early period of their typhoid fever. In a very small percentage of cases the general malaise with headache has caused sufficient inconvenience to keep the case in bed the following day. A certain percentage of cases have had a rise in temperature. In most instances this has been slight, though in one case it reached 103° F. A few individuals have complained of itching of the skin. It has been noted in this series as in others that the reaction is generally comparatively severe in those who have had or have chronic malaria.

A very few cases have had a slight diarrhœa following their inoculation.

One of the arguments of that group of individuals who are opposed to prophylactic inoculation in general, is that an inoculated individual is more susceptible to acute infectious diseases than an uninoculated one. In this series of over seven thousand cases there seems to be no reason for concluding that, in this comparatively large series, there has been any relation between antityphoid inoculation and increased susceptibility to infection. The possibility of an increased susceptibility to infection was considered, and precautions were taken to minimize it. All inoculated individuals have been relieved from their duties for forty-eight hours and certain very definite instructions given to them. In the series under consideration, the inoculated men were not more susceptible to rhinitis, pharyngitis and tonsillitis than the uninoculated. It might be further stated that there has not been a case of typhoid fever develop in the troops since inoculation began, although there have been a number of cases in the cities where the men were in barracks.

In one instance it was advisable to inoculate a nurse ten days after an operation for appendicitis. There was a slight rise in temperature following the inoculation, but the wound showed no change and there was nothing in her convalescence even to suggest that her antityphoid inoculation had interfered in any way with her convalescence.

There has been considerable interest in the advisability of inoculating individuals who have had tuberculosis. We have had three instances where inoculations were given to men who had been treated for this disease. In these men the diagnosis was without question. Each of them had received sanitarium treatment and the lesions pronounced healed or inactive. Two of them were physicians. The reactions in these three cases were not any more severe than in the other men, nor has there been any untoward result from the inoculation. We would not leave the impression that we advocate the inoculation of those who have active tuberculosis. On the other hand, we would oppose it on the principle that such cases should not be subjected to any mental or physical conditions that might lower their resistance, if such could possibly be avoided. When one considers the high percentage of cases that have died of some other disease and yet show at post mortem evidence of tuberculosis—active, inactive, or healed,—it seems fair to assume that a considerable number of soldiers would show the same. The physical examination of troops to-day is done with such care that tubercular lesions, save the smallest inactive or healed ones, rarely pass undetected. Should a man with an inactive or an active lesion be taken into the army, and these lesions later extend locally, or from them a miliary tuberculosis result, antityphoid inoculation cannot be held wholly responsible for them. Infantry drill, rifle drill, and route marches test the endurance of the best of men, and surely nothing could favour more the development of activity in inactive lesions or increase the activity of active ones.

Circumstances have been such that all our vaccine has been put in bottles closed with rubber caps. The emergencies of the present war have been such that regular vaccine rubber caps could not be secured. As a substitute we have used very heavy finger cots, and have found them perfectly satisfactory. In fact we know of no better rubber cap if it is properly prepared. We have prepared them as follows: the powder which adheres to them is removed. They are then soaked in weak carbolic acid for four hours, after which they are thoroughly washed in several changes of distilled water and rolled as follows. The cot is placed over the index finger, closely rolled upon itself completely up to the tip, when the tip is inverted. This gives a thick collar of rubber with a single thickness of rubber to close the mouth of the bottle. The rolled finger cots are now thoroughly sterilized by boiling, when they are ready to apply to the bottles. The sterile caps are removed from the water in which they were sterilized by sterile forceps, and forced over the necks of the bottles. The collar which results from rolling the cot upon itself fits tightly about the neck of the bottle. The comparatively thick rubber cap is easily punctured, and the punctured holes scarcely ever leak, even before the caps are paraffined. After the caps have thoroughly dried, they are dipped into hot paraffin.

We have supplied vaccine made as above for the inoculation of over seven thousand troops, and in no instance has there been an infected arm, nor have the local or constitutional reactions been in the least alarming. Neither is there any evidence obtainable that those inoculated were any more susceptible to acute infections than the uninoculated in the same barracks.

Permission for the publication of this article has been obtained from Col. E. W. Wilson, O. C. Fourth Divisional Area, Militia Headquarters, Montreal.

A THREE months' course for war probationers has been arranged at St. Bartholomew's Hospital, London. Courses of three and six months' duration have also been arranged at University College for the same purpose. The probationers will serve in military hospitals under fully qualified nurses. Four hundred applications have been received at St. Bartholomew's Hospital although not more than forty can be accommodated.

ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PHTHISIS

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Part III

(*Continued from page* 388)

IT is of first importance to interpret the readings of the manometer correctly, not only at the initial puncture, but at subsequent punctures and during the introduction of gas.

Between the layers of the pleura there is normally a potential cavity which, in the cadaver, has a negative pressure of 6 mm. of mercury, or 82 mm. of water. Manometric fluctuations cannot take place until some air has been sucked into the pleura, or other potential space, by the yielding of the water column, or until there has been a leak from the lung, because of puncture by the needle. Morgan[51] lays stress upon the latter and attributes to it incorrect impressions of intrapleural pressures and of estimations of the amount of gas introduced. Fluctuations will vary directly, within certain limits, with the bore of the needle. The fluctuations of a small needle approach the true mean pressure, which is nearer expiration than inspiration, as recorded by a larger needle, *i.e.*, while reduced in range their average is higher.

Intrapleural pressure will be modified in normal persons by individual characteristics, as well as by the already mentioned site of puncture and decubitus. Aron[64] gives the average pressure for a normal man as $-4{\cdot}69$ mm. Hg. on inspiration, and $-3{\cdot}02$ mm. on expiration (-63 to -41 mm. H_2O).

In phthisical chests deeper respiratory movements and the retraction of the fibroid lung account for greater negative pressures when the pleural cavity is free. On the contrary, when adhesions are present, these will take up the natural retracting pull of the lung and there will be a reduced negative pressure, and the range of the fluctuations will also be less. Aron's pressures for a phthisical man are $-7{\cdot}49$ mm. Hg. on inspiration, and $-6{\cdot}83$ mm. on expiration (-101 to -92 mm. H_2O). We find the readings for the average advanced phthisical chest chosen for operation, in which some adhesions are usually present, for ordinary respiration to be −120 mm. H_2O on inspiration, and −70 mm. on expiration. On deep respiration the excursion may be much increased, −300 mm. on inspiration, to −40 mm. on expiration, or more. The mean pressure is always on the negative side and on holding the breath in any phase of respiration pressure is maintained. We have found an exception to this test which is mentioned under paradoxical movements. Many patients have great difficulty in holding their breath on inspiration and this test sometimes seems to fail, as the negative pressure diminishes when the breath is apparently held. The breath can be held without difficulty on expiration. The several points are well illustrated in Charts I and II, taken from v. Muralt's paper.[60] These charts also contrast the difference between a free pleura and one with adhesions.

We find that a free pleural space of sufficient size surrounded by firm adhesions and with a strongly retracting lung underlying may give a pronounced negative pressure and wide fluctuations in ordinary respiration but the excursion on forced respiration is not as great as when a larger pleural space exists. When a network of adhesions exists in the pleura there may be but a slight negative pressure and small fluctuations of 5 to 10 mm.; but the mean pressure is negative. Pressures similar to those just mentioned may be found between the parietal pleural and the thoracic wall, a pull being communicated from the pleura. This is especially likely to be the case when there are adhesions between the pleural layers (Davies[26]).

If the needle has perforated the visceral pleura and lies in lung in free communication with bronchial air the manometer readings are materially different (Chart VI). The amplitude of fluctuation is marked, and modified by the depth of respiration and the freedom of communication with a bronchus. Inspiration and expiration have negative and positive pressures, respectively, and the mean pressure is always approximately 0. On holding the breath at any phase of respiration the pressure is not maintained but approaches 0 if the glottis is open. On the contrary, the pressure will be maintained if the glottis is closed (v. Muralt and others). The maintenance of pressure on holding the breath is, therefore, not an infallible test excluding the possibility of the needle point being in lung tissue.

When the lungs are emphysematous there may be small oscillations about a mean negative pressure, indistinguishable in themselves from those observed when the needle is in a small pleural space (Holmgren[62]).

If the needle has penetrated a blood vessel the pressure may be so low that no blood enters it; but, as has been mentioned previously, gas may be aspirated by the yielding of the water column to the slight negative pressure communicated during inspiration. There may be sufficient pressure, however, for blood to enter the needle, when a slowly rising pressure will be noted without oscillation, because of the capillary action in the needle and rapid coagulation. An unusual degree of pain may be complained of when the needle penetrates a blood vessel (Holmboe[65]).

The needle may possibly pass through the diaphragm into the abdominal cavity when a reversal of pressure for inspiration and expiration will be noted.

The manometer may be a great aid also during the introduction of gas by explaining the intrathoracic conditions that exist or the changes that take place. In a pleural space fairly free from adhesions there is a gradual rise in pressure proportionate to the amount of gas introduced, with a gradual lessening of the amplitude of fluctuations. The freer the space the slower is the rise in pressure. After the force of cohesion has been abolished by the introduction of a moderate quantity of gas, there is a further material retraction of the lung, according to Saugman and Hansen, with consequent rarefaction of the gas and an increased negative pressure. Compensatory enlargement of the side and increased respiratory movement may also possibly reduce the pressure. A litre or more of gas may be required to bring the mean pressure to 0 (Chart III). As the average pleural cavity will contain about 3,500 c.c. of gas (Davies), the amount of gas introduced will give some idea of the amount of compression of the lung that has been obtained.

When adhesions are pronounced the rise in pressure is more rapid, but is at first in proportion to the amount of gas introduced, then, as the limit of collapse is reached, pressure rises rapidly. The abruptness of the rise indicates the size of the cavity. If, after a litre of gas has been injected, the pressure is 40 mm. water, about half the cavity has been filled (v. Muralt). A rapid rise after a very small amount of gas, less than 50 c.c., has been injected, suggests the possibility of the needle being in a false space. The range of fluctuation is less than when adhesions are absent and may disappear with increasing pressure. If there is a fall in pressure, followed by a rise, it is probable that an adhesion has given way, provided that other leakage can be excluded (Chart IV, B).

When there is a network of pleural adhesions a few centimetres of gas will cause a rapid rise of pressure, followed by a slow fall as the gas disperses. Each subsequent amount of gas causes a higher initial rise (Chart V). Similar readings may follow the introduction of gas between the pleura and chest wall.

If the needle is in the lung the gas introduced causes no rise of pressure, or only a transitory one, according to the freedom of communication with a bronchus. In an emphysematous lung there is a slow rise in pressure as if a pocket were being formed, but the gas escapes easily (Holmgren).

At subsequent fillings the manometer gives still further information and serves as a guide to the frequency of refills and the maintenance of an optimum pressure.

In the earlier months the fall in pressure between refills is a fair indication as to the rate of absorption of gas, and of the reexpansion of the lung. Later, as the lung becomes fibrosed, there is less reëxpansion, and, as the gas is absorbed, there is rarefaction so that the same direct relation between absorption and expansion no longer exists. Therefore, when the lung has reëxpanded, the rise in pressure, as the gas is introduced, will be gradual; when it remains collapsed there will be a slow rise at first, and later an abrupt rise (Hamman and Sloan).

Of great importance is the information given about the shifting of the mediastinum. When it is easily displaced the range of fluctuations is small, and the rise of pressure becomes disproportionately slow, after there has been a steady though slow increase of pressure to a certain point. After this point has been reached, only slight variation of readings may follow the introduction of several consecutive decilitres of gas. Compensation for the expansion of the affected side on inspiration is made by the encroachment of the functionating lung upon the mediastinum, and for contraction by expiration by the yielding of this lung, so that the fluctuations have a limited range, because of the swing of the mediastinum.

When the mediastinum is relatively fixed the fluctuations are greater and the rise in pressure is relatively more rapid and finally more abrupt. Here the encroachment of the functionating lung is less and it cannot so easily compensate for the effect of respiratory movements upon the affected side. In either case the earlier pressures will be modified by the degree of expansion of the affected lung. We have confirmed these observations by physical findings a number of times, but only once with a skiagraph, since we have only occasional opportunity of obtaining a plate.

Von Muralt finds that with a movable mediastinum the pressure rises too quickly in proportion to the size of the cavity, and that the range of fluctuation is too small; and with a fixed mediastinum the pressure rises too slowly and the fluctuations have a relatively large range. Hamman and Sloan[41] make a statement on this point which is exactly the reverse of v. Muralt's. Neither of these views appears to us to be theoretically sound.

The incidence of an effusion may be early suspected at the time of a refill because of an unexpectedly high pressure, and because of interference with the oscillations by drops of fluid entering the needle.

The ultimate pressure to be obtained will vary with the size of the cavity. As a general rule the better and greater the pneumothorax obtained, the less need be the pressure (Brauer and Spengler). The exclusion of the compressed lung from movement aimed at may possibly be obtained by an ending inspiratory pressure only slightly positive. A mean pressure of 14 to 40 mm. water will be required to compress a not too fibrous lung (Davies). One more dense will require 50 to 100 mm. mean pressure (Lillingston). Incomplete collapse because of adhesions or fibrous lung will require still higher pressures and in limited cavities 300 to 400 mm. pressure may sometimes be used with impunity (Lillingston). A mediastinum that is fixed because of adhesions will bear pressures safely which might be dangerous, both immediately and remotely, with a movable mediastinum. The comfort and well being of the patient will set for each one his own optimum pressure which can be maintained or modified with the aid of the manometer.

Reversed movements of the manometer are occasionally seen. They occur unexpectedly so that, from time to time, the phase of respiration should be definitely compared with that of the fluctuations. They are due to paradoxical movements of the diaphragm. When a low pressure obtains, the cause is a paralysis of the diaphragm on the side of the pneumothorax through which is transmitted the positive inspiratory abdominal pressure. When a high pressure obtains the diaphragm becomes concave on one side through the pressure of gas, and, aided probably by adhesions, contracts during inspiration and this produces a positive pressure (v. Muralt). In one case, with a large gas cavity, and a fixed mediastinum, we have seen another paradoxical movement over a period of several months. When the breath was held on inspiration there was a sudden rise in pressure to a point exceeding the ordinary expiration. The fluctuations on respiration were normal and the degree of pressure, whether + or −, did not influence the phenomenon. In other cases a similar phenomenon has been seen. The *x*-ray has shown adhesions between lung and diaphragm in two such cases.

Where there is uncertainty about the presence of the needle point in the pleural space, or because adhesions modify the pressures, as shown by indefinite manometric fluctuations, some manœuvres may help to greater certainty about its position and to the creating of a freer space. If even slight oscillations (5 to 10 mm.) are present, a space of some kind exists at the needle point. Gas can then be introduced into a vein only indirectly after it has entered the tissues, but it is just with the difficult cases that an embolism may occur.

Attention has already been directed to obstruction of the needle.

Forlanini advances the needle cautiously, and at different levels presses in a little gas by pinching the tubing and by thus enlarging the space at the needle point obtains more decided readings. If there has been a separation of the pleural layers the negative pressure will become greater than if the gas has been merely squeezed into extra-pleural tissue. He has also suggested the use of a syringe, which is to be adjusted to the butt of the needle and suction made. If no blood comes gas may be introduced. Saugman advances the needle till the manometer shows that it is in the lung and then withdraws it until oscillations cease, when he applies Forlanini's syringe test. If no blood comes he forces in gas under pressure. Brauer has had accidents notwithstanding the use of the syringe. Holmgren injects a small quantity of physiological salt solution with a syringe. If the needle is in lung the patient will cough, but he will not do so if it is between the pleural layers. He may also expectorate a foamy sputum if the lung has been entered. After producing a small cavity by this procedure he forces in gas under high pressure. One very serious accident and one fatal case have, however, resulted from this procedure. He thinks in these cases and in other similar accidents recorded, a true pleural cavity was not formed.

If the needle has entered an emphysematous lung the small oscillations about a mean negative pressure are confusing. The aspiration and injection tests above mentioned should be applied; and a few drops of a strongly smelling oil in the filter will be a further help if it is decided to admit gas. The patient will notice the odour if there is escape into the lung. It has been already stated that when the needle is in this kind of lung, gas escapes easily with a slow rise in pressure which subsequently falls slowly and steadily; when in pleural adhesions, the gas does not escape easily and the rise in pressure is abrupt with subsequent slow fall on dispersion of gas.

The suction test with the syringe is useful at refills when only a small space has been formed and the pressure has fallen so that the mean pressure is about 0.

Brauer's open method can be used when there is failure to establish a space by the more usual way.

High pressures, maintained for months during a series of injections, have been used for the formation of a cavity and remarkable compressions have finally been obtained. Saugman has used a pressure of 30 c.c. or more of water. He has never exceeded 8 c.c. Hg.; but he, with other observers, has become much more conservative. Davies places the limit at 14 c.c., Floyd at 12 c.c. of water. We have known a patient to be most comfortable during many months when the ending mean pressure was about 14 c.c. In six instances we have had misadventures, which were fortunately not serious, when we endeavoured to enlarge ineffective gas cavities. In three of these cases a leak into the mediastinum took place after cavities of about 200, 300, and 400 c.c. content had been formed, at 50, 110 and 120 mm. water pressures respectively. The first occurred at the first inflation and may have been due to injury of the lung by the needle. In a fourth case, after establishing a cavity of 700 c.c. at 200 mm. pressure, at the third injection, reversed manometric readings were noted and gas was found to have entered the abdomen. In two other cases gas escaped through the lung after small pneumothoraces of 400 and 700 c.c. had been formed at pressures of 280 mm. water each at the fourth inflation.

Emphysema, both superficial and deep, may follow the operation. The gas may escape along the needle track after high pressure or cough, or it may have been injected into wrong places. Subcutaneous emphysema of varying extent is not infrequent when high pressure has been used, or if there is much cough, especially if the needle used has been a large one. If the gas is forced between the parietal pleura and the thoracic wall, it may later be felt, or the râles heard, above the first rib and clavicle; but crackles will not be heard over the gas cavity. When the lung has been wounded gas may escape along the lung septa to the hilus with resulting emphysema of the mediastinum. The gas from the cavity may be augmented by air from the alveoli and great pressure dangerous to life may then develop. A mediastinal emphysema causes more or less discomfort from a sense of pressure in the middle of the chest; swallowing may be painful; and emphysematous crackles may be heard under the sternum and heard or felt deep in the neck. The patient also hears râles on swallowing and the neck may become quite swollen. None of our cases of emphysema have suffered material discomfort.

The patients are always carried back to bed from the operating room after the earlier operations, where they remain until the pneumothorax has been well established. After it has been shown that the inflations are being well borne, they are allowed to walk to their rooms, except those cases in which the mediastinum is easily displaced. These patients stop in bed for twenty-four hours. For some weeks patients are kept very quiet in order to safeguard the better lung, during which time they are frequently examined, and pressures modified, if necessary, to ease it if râles appear or increase. When we are assured that it bears the extra work thrown upon it, considerable exercise may be allowed.

A careful examination of the chest is made before and after each inflation. Until collapse or compression has been established the greater interest lies with the development of the gas cavity, its effect upon the suppression of the function of the lung, the displacement of the heart and its possible embarrassment. When the affected lung has been fairly excluded from respiration, interest centres on the changes of physical signs in the better lung, resulting from the exclusion or reduction of transmitted adventitious sounds, the possible modification of percussion note, and of respiratory and voice sounds, because of the adjacent large gas cavity.

A fair estimation of the position, size and development of the pneumothorax can be obtained from percussion and auscultation; but after it has become fairly well developed one may only speculate, from the physical examination, on the degree of compression and the situation of the lung, and on the position of the heart when it has left the chest wall, in the absence of the Roentgen examination. The hyperresonant or tympanitic note enables one to define with fair accuracy the outline of the gas cavity; but very light percussion should be used at the margins, else an exaggerated idea of its extent will be obtained. True coin sound, while often present, is surprisingly frequently absent when there is even a large gas cavity. It is not usually found until after several inflations; but once present it seems to us to be independent of the pressure registered before and after the inflation. It may be found early, and after only a small inflation in small cavities with relatively rigid, smooth walls (Saugman). The breath sounds are materially weakened after the first inflation, and become more so with each increase in the amount of gas until they may be entirely suppressed; but they are often extremely persistent. They are virtually, rather than entirely, absent in most cases. It is often surprising how little they receive amphoric modification, a fact that is some apology for the frequency with which spontaneous pneumothorax is overlooked. The heart may often be outlined after the refill; but it is not at all unusual to find no certain area of cardiac dulness and the points of maximum intensity of the sounds must then help to determine its probable position.

Over the better lung a slightly tympanitic tone may modify the percussion note, apart from the relaxed note which may sometimes be present because of too great compression. Resonance, too, may slightly alter the quality of the breath and voice sounds apart from the compensatory modification which is expected, but which is often not appreciable. The reduction in the number of râles by exclusion of transmitted sounds may suggest a dramatic improvement; but râles modified in quality may now be transmitted, while, on the contrary, a consonating quality previously lacking may be given to râles belonging to this lung and lead to confusion. It is probable that circulatory and respiratory changes in the lung may very soon influence the number of râles favourably. Râles may develop, however, as the result of too great encroachment of the inflated pleural cavity. When uncertain as to the progress of the disease in this lung the improvement in the general condition may be reassuring, and, while the pressure may be lessened as a precaution, one should not too lightly decide to abandon the pneumothorax.

The fluoroscope and skiagraph are essential to a fair understanding of the changes that have taken place on the treated side and of the actual condition of the functioning lung. The lack of them is a very real handicap also in determining the best time for refills and the degree of compression that should be maintained.

The condition of the better lung and the flexibility of the mediastinum should be the determining factors in the estimation of the pressure to be applied. The functioning lung breathes more deeply the more the other is excluded, and the less easily the more the mediastinum is shifted (Aron). A slow increase in pressure, brought to a moderate degree only, while its effect upon the better lung is watched, and while time for readjustment of the organs and of the circulation to the changed conditions is allowed, is, we think, of greater moment that the attempting to obtain any ideal of compression for the affected lung.

The gradual method of inducing collapse of the lung described above, causes but few symptoms when the pleura is relatively free of adhesions, and the patients are scarcely conscious of changes in the chest. They may feel slight shortness of breath and become easily fatigued as the gas cavity becomes enlarged. Cough may be increased after each inflation but soon becomes reduced, and sputum, which also may be temporarily increased after inflation, lessens. Slight blood staining of the sputum has been noticed, undoubtedly due sometimes to pricking of the lung. Respiration, at first slightly increased, becomes slower if there is not too much disease in the better lung. The heart action becomes more frequent at first, but may later be slower when at rest than before the compression. It is easily accelerated on movement. If tachycardia persists after the temperature falls and after sufficient time has elapsed for adjustment of the thoracic organs to altered conditions, it is an unfavourable sign (Lillingston). Fever may be induced or increased by the operation temporarily, and must be considered a symptom of auto-inoculation. Dyspepsia, especially when the left lung is collapsed, is sometimes complained of. Hiccough was rather persistent in one such case. There is sometimes loss of weight, usually temporary, although the patient may be doing well. If adhesions are being stretched by lung pressure, pain may be severe in the chest and be widely referred to neck and head. Pain in the chest is increased by cough. Subcutaneous emphysema, if extensive, causes tenderness and hyperæsthesia and may follow high pressures or severe coughing. Internal emphysema, such as we have seen, has caused comparatively slight symptoms. Fainting, eighteen hours after the inflation, occurred with one case whose mediastinum was very movable when the ending mean pressure was 0. It happened shortly after getting out of bed for the first time. We have not seen pallor or cyanosis, and only trifling sweating. Gas can always be removed with prompt relief for any urgent symptoms, except when an open pneumothorax exists or when mediastinal emphysema is being maintained by a supply of alveolar air. More or less distressing symptoms have been described as the result of the operation; but we think they must be due largely to abrupt changes in intrathoracic conditions.

There are other complications occasionally to be ascribed to the operation. Hæmorrhages from the better lung have been reported because of the increased blood pressure on tissue already damaged. Aspiration pneumonia, while a possibility, is of rare occurrence and unlikely if the pneumothorax has been gradually induced. The rapid induction of pneumothorax for severe hæmorrhage is, however, warranted. Meningitis has occasionally followed the induction of pneumothorax (Forlanini).

The outstanding complication of induced pneumothorax is serous effusion into the pleural cavity and it occurs in from 40 to 50 per cent. of all cases when the pneumothorax has been maintained for some considerable time. Some writers speculate upon the inevitableness of it in all long continued cases. Von Muralt[66] finds that in his own experience, and in that of most men of large experience, half the cases, approximately, develop effusion. The incidence varies directly with the intensity of the disease when groups of cases are compared. Its occurrence is frequently not noticed by the patient and he simply does not feel the need of a refill at the usual time. The onset may, however, be that of a more or less acute inflammatory process. The period of onset in the writers' group, after the initial operation, has been from five weeks in an acute case to twenty-two months in a chronic case. Six cases have developed it at an average period of seven months, out of twenty-six cases treated, thirteen only of these were effectively compressed for a considerable time.

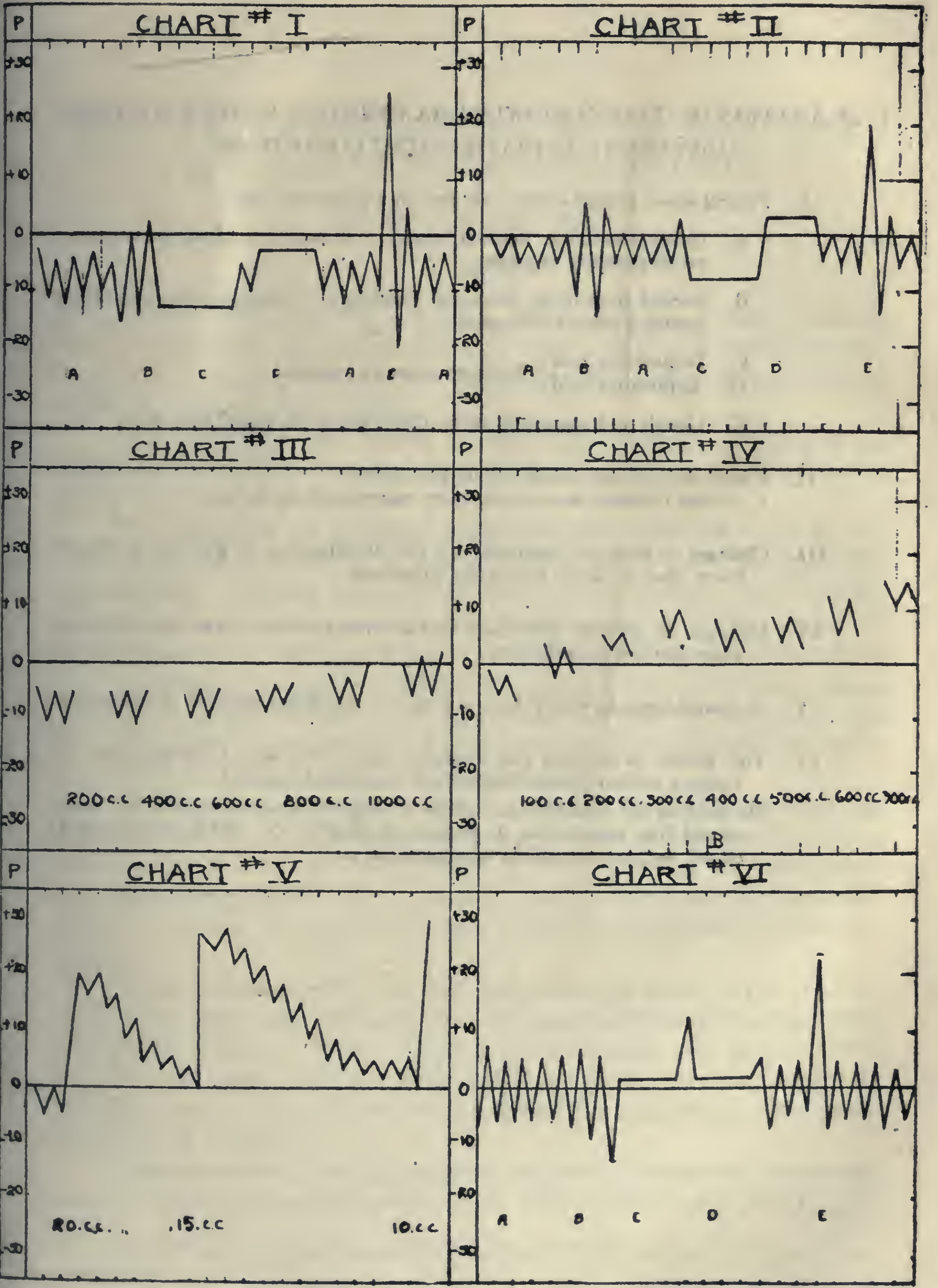
The effusions must be regarded as exudates rather than transudates. In a majority of cases they are tuberculous, though Brauer[67] has also found them in non-tuberculous, bronchiectatic cases. The effusion may disappear in a few weeks or months; but it is more usually of long duration. Serous at first, it gradually becomes richly cellular, and is chemically of an inflammatory nature. Tubercle bacilli are usually found, but with difficulty, and rarely are there other organisms present. Von Muralt finds that certain persons are predisposed to pleural inflammation. Grätz[19] lays stress upon the greater ease with which a tuberculous process in the pleura can develop when the opposing protecting layer is separated from it, and Saugman thinks the development of such foci is favoured by the stretching of the pleura or adhesions. The pleura may be irritated by the constant presence of the gas; but the degree of pressure seems to be of no moment in producing effusion. Opinions are diverse on these two points. The changes produced by pressure upon the blood vessels and upon the lymphatics, and the interference with the normal physics of the pleura, do not seem to be important as the exudates are of definitely inflammatory character. Infection from without may sometimes take place, or from within. Such an infection from within has been mentioned in the report of our cases. Chill and overexertion are the marked exciting causes. It is obvious that the parietal pleura with the lung separated from it by a layer of gas can be very easily chilled. Irritation of the pleura may possibly be a cause, and Moreland[49] especially urges the use of a fine needle as a preventative. The treatment is usually conservative as relatively few are seriously inconvenienced by the effusion, though interference in the more acute inflammations is sometimes necessary. In a number of cases the presence of fluid had a favourable effect upon the course of the disease, for which there is probably a serological explanation. The absorption of gas is retarded so that refills become less frequent. The pressure may have to be adjusted from time to time according to the intensity of the process and the size of the cavity. Refills may readily cause fever which disappears as the pressure and absorption become mutually adjusted. A relatively low pressure should be maintained in febrile cases unless the cavity be small. Adhesions may become pronounced, and later reëxpansion of the lung may be interfered with; or the satisfactory compression of the lung may become impossible because of them, or because of rapid absorption of fluid and consequent adherence of the reëxpanded lung.

When a cavity containing fluid is being inflated the gas should not be allowed to enter through the fluid. Forlanini describes a case of pleural reflex which recurred several times because this was done.

In many cases this treatment will require much patience on the part of the patient, and much time as well as patience on the part of the physician. We have not been able to give the time, and possibly have not had either the patience or technique necessary to apply the treatment successfully to those patients who do not give fair promise of success after a few trial punctures, though in three difficult cases we have at different times made twenty or more punctures for each. After nearly two years' trial of the method, in which there have been a fair proportion of successes, a number of futile attempts, most of which were inevitable, and some mishaps, we have found that the successful compressions have been usually obtained without much delay.

References (*concluded*):—

64. Aron, *Berl. Klin. Wchnschr.*, 1913. l, 7.
65. Holmboe, mentioned by Lillingston [11].
66. v. Muralt, *Beitr. z. Klin. d. Tuberk.*, 1914, Sup. Bd.
67. Brauer, mentioned by v. Muralt. [66].



After v. Muralt; Beitr. z. Klin. d. Tuberk., xviii, 1910.

Note.—For explanation of charts see page 502.

EXPLANATION OF CHARTS SHOWING MANOMETRIC READINGS UNDER DIFFERENT INTRATHORACIC CONDITIONS

I. Pleural space almost completely free in a phthisical man:

- A. Quiet breathing: marked negative pressure, marked fluctuations, mean pressure negative.
- B. Forced breathing: increased amplitude of fluctuations, expiration giving a positive pressure.
- C. Inspiration held: } Pressure remains constant.
- D. Expiration held: } Pressure remains constant.
- E. Cough and straining: great fluctuations on either side of 0.

II. Fairly widespread adhesions of the pleura:
Letters indicate same respiratory movements as in I.

III. Changes in pressure produced by the introduction of gas into a pleural space that is fairly free from adhesions.

IV. Changes in pressure produced by the introduction of gas into a pleural space limited by adhesions.

V. A pleural space in which there is a more or less dense network of adhesions.

VI. The needle is in lung and communicates freely with bronchial air:
Letters indicate same respiratory movements as in I.

On holding the breath at any phase of respiration the pressure is not maintained but approaches 0, remaining slightly +. *When the glottis is closed, the pressure will be maintained as in* I.

ON THE OCCURRENCE OF FLUID EXUDATE IN CASES OF LOBAR PNEUMONIA

By Wm. Goldie, M.D.

Toronto

LOBAR PNEUMONIA is such a frank disease, and so distinct in type, that the diagnosis is as a rule readily and rapidly made, and in its course it rewards the observer with more minute findings than any other acute disease.

Unfortunately this wealth of signs has brought about a most deplorable result, for no adequate explanations are given of the many and variable findings.

The treatises on Physical Diagnosis and Practice seem to vie with each other in putting forward wonderful and usually impossible hypotheses. Clinical teachers are just as ingenious. The student and the practitioner can see nothing but chaos and the fancies of individuals, and he views with suspicion any new explanation. Only experience can give value to the signs he may observe. As a rule he is content to make the diagnosis, nor will he reëxamine the chest until the development of new symptoms or the delay of crisis reminds him that all may not be going well.

In this short communication I do not intent to deal with the physical laws by which the signs must be interpreted, but rather to direct attention to the occurrence of fluid exudate in the pleural sac, that complication of pneumonia, which being usually unrecognized, has been the source of many of the misinterpretations of the findings.

It has humbled all of us, and disheartened many, by its failure to give the signs and the variations of signs that the text-books state should be present. This I believe is so because the guides given are those of large amounts of fluid limited by walls under moderate tension,—such signs as are present when the consultant, the writer of books, is called in.

There are few or no guides given us by which we can determine the presence of the fluid when it is first exuded over solid lung.

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* Read at the annual meeting of the Canadian Medical Association, London, Ont., June, 1913.

How often in these cases have we heard that the pleural sac filled up to the third or second rib in twenty-four hours,—and worse, how often have we believed this statement?

To the pathologist, unversed in the lore of clinical medicine, it is inconceivable that this serous membrane should not react to inflammation as all other serous membranes do, and hence he would expect to find fluid exudate in the majority of the cases of pneumonia, and what is more, he would be justified in this expectation by his autopsy findings, for the findings of fluid are very high; the 46·4 per cent. of Norris, the 48·5 per cent. of Kerr, being examples; and these percentages he would expect to be much greater in the clinical records, when he considers how many cases die in the early acute stage before a healthy reaction could take place.

But the clinical findings do not bear out such an expectation, for clinical records vary from the 5·3 per cent. of Eyre, the 5·5 per cent. of Aufrecht, the 6 per cent. of the Toronto General Hospital, in the years 1907 and 1908, to the doubtful record of 58·3 per cent. in children of Slalowerchownikov, the belief of Reilly in 50 per cent. and the belief of Anders that some degree of effusion, though often slight, is present in practically every case of pneumonia.

The latter author points out, however, that the autopsy results show a larger number of cases of sero-fibrinous effusion than do clinical records, owing to the fact that the condition cannot often be detected during life by the physical signs. Like statements with regard to the difficulty of making a diagnosis of the presence of fluid occur in all the writings. That this should be so must mean that not sufficient attention has been paid to the conditions that must obtain as soon as a small amount of fluid has exuded into the pleural cavity over the solid lobe.

My attention was first directed to the possibilities of diagnosis of the early occurrence of fluid exudate over consolidated lung, by a repeated correction that was made by the students in making notes of their findings in frank pneumonia. Under the head of inspection and palpation, the terms "slight movement" or "less movement than on the other side" were altered to "no movement" or "hardly any movement" after percussion had revealed dullness, and auscultation, bronchial breathing.

Having made sure that the latter observations were correct, those of inspection and palpation were reviewed and there was no doubt that the first record of "slight movement," or "less movement" was correct also.

It was easy to understand why the change had been made, but the question that presented itself was, how could there be any real movement over a large area of completely solid lung?

Surely no movement could take place over this area, where the lung was so fully distended with fibrinous exudate as to take on the markings of the ribs and interspaces. It was impossible to account for the amount of movement described in these cases unless air or fluid was present between the solid lung and the chest wall.

Other frank cases were watched from the onset, the lung became solid, the friction rub became less, and the movement was abolished, then, in a day or so, without any appreciable change within the lung, the friction was found to be absent or higher in the chest, and the movement of the chest wall was distinct. A needle was introduced and a small amount of fluid exudate was obtained. This observation was repeated from time to time in a rather desultory manner until I had become convinced that it was of value and that it, as far as I could find, had never been recorded.

During the last year the test was applied to all the cases of croupous pneumonia of pneumococcal origin which entered the service of Professor McPhedran at the Toronto General Hospital, and in nearly all cases, whether the sign was present or not, the needle was introduced for control.

Thirty-seven cases came under observation. Of these, twenty-six (26) cases gave this sign and the corroborating sign of more or less distant breathing over the lower limits of the lung; in twenty-two (22) of these, the needle was introduced and fluid obtained. In the remaining four (4) the needle was not used because of a misunderstanding.

In eight cases (8) in which this sign and the corroboratory one were absent throughout the course of the disease, no fluid could be obtained by the needle, and in three others with negative signs needling was neglected.

So constant were the results, that I presume that it is fair to include the cases not subjected to the needle in calculating the percentage. That is, in thirty-seven (37) consecutive cases of croupous pneumonia, twenty-six (26) showed the presence of fluid exudate, a percentage of 70·2 per cent., or including all the unneedled cases as negative, the percentage is 51 per cent.

The character of the movement and the amount of the movement of the chest wall can be demonstrated more readily than described. It is rarely of the expansile character and never elastic with the uneven play, but it is a definite increase in diameter and not merely the muscular tug as felt over the solid lung.

So ingrained is the idea of immobility of the chest wall where fluid exudate exists that you will at once question the possibility of movement, but for the moment discard this tradition and consider which is the most pliable, solid pneumonic lung, or fluid.

Suppose the lower part of the pleural sac were filled by a mass of plaster of paris, it is impossible to conceive of movement of a rib whose whole length lay over it; but if the same area were filled with fluid and muscular force applied to the overlying rib then surely that rib would move and bend, and the underlying fluid accommodate itself to that movement.

I do not wish to labour the question, but would beg you to make the test, and ascertain the value of the sign.

The knowledge that fluid exudate occurs in 70 per cent. of the cases of pneumonia and that a diagnosis is possible is of value, first in the light that it sheds on the slight variations in other findings, and the definite interpretations that can be made of these variations, using them to check up the increase or decrease of fluid; secondly, in explaining the atypical course and conclusion that so frequently occurs; and thirdly, in averting the disasters that come from pressure due to large effusions.

The following case illustrates not only the value of the chest wall movement as a sign of fluid, but also other points of interest.

A young man was admitted on the sixth day of illness as a frank pneumonia with a temperature of 102°, respiratory rate 34, and pulse rate of 110. On examination there was found to be dulness from the fourth rib downwards, corresponding to the middle and the lower lobes, and over this area vocal fremitus was marked and bronchial breathing was almost amphoric in quality. But the movement of the chest wall was such as could not be reconciled with solid lung, so the other findings were reviewed, both vocal fremitus and the bronchial breathing were found to be of peculiarly superficial character, as if the vibrations or sounds arose immediately beneath the skin, not giving that indefinite quality as if they had "come through." A needle was introduced and 10 c.c. of fluid withdrawn, with the result that the whole picture changed, vocal fremitus disappeared, and the breath sounds were inaudible except at the upper level.

The following day 20 c.c. of saline solution was introduced, with the result that all the original findings returned. Subsequently 62 ounces of fluid were removed.

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The following is the list of contagious diseases reported in Ontario during the month of April: smallpox, 38 cases, 1 death; scarlet fever, 171 cases, 2 deaths; diphtheria, 187 cases, 15 deaths; measles, 922 cases, 5 deaths; whooping cough, 80 cases, 6 deaths; typhoid, 27 cases, 5 deaths; tuberculosis, 144 cases, 92 deaths; cerebro-spinal meningitis, 17 cases, 14 deaths.

The epidemic of measles in Hamilton has by no means subsided and, in spite of the efforts of the health authorities, numbers of fresh cases continue to appear. During April out of the 922 cases reported in the province, 485 occurred in Hamilton. During the past six or seven months diphtheria has been prevalent in Ottawa and from November to May over four hundred cases were reported and thirty-two deaths occurred. The matter has been taken up by the local board of health and at a recent meeting it was resolved that a fully qualified medical man should be appointed to deal with the epidemic, the physician appointed to work under the direction of Dr. Law, the medical officer of health, and to receive an honorarium not exceeding $175 a month. In accordance with this resolution, Dr. W. T. Shirreff, former medical officer of health of the city, was appointed on Tuesday, May 4th, for a period of three months. Dr. Shirreff assumed his duties at once.

Case Reports

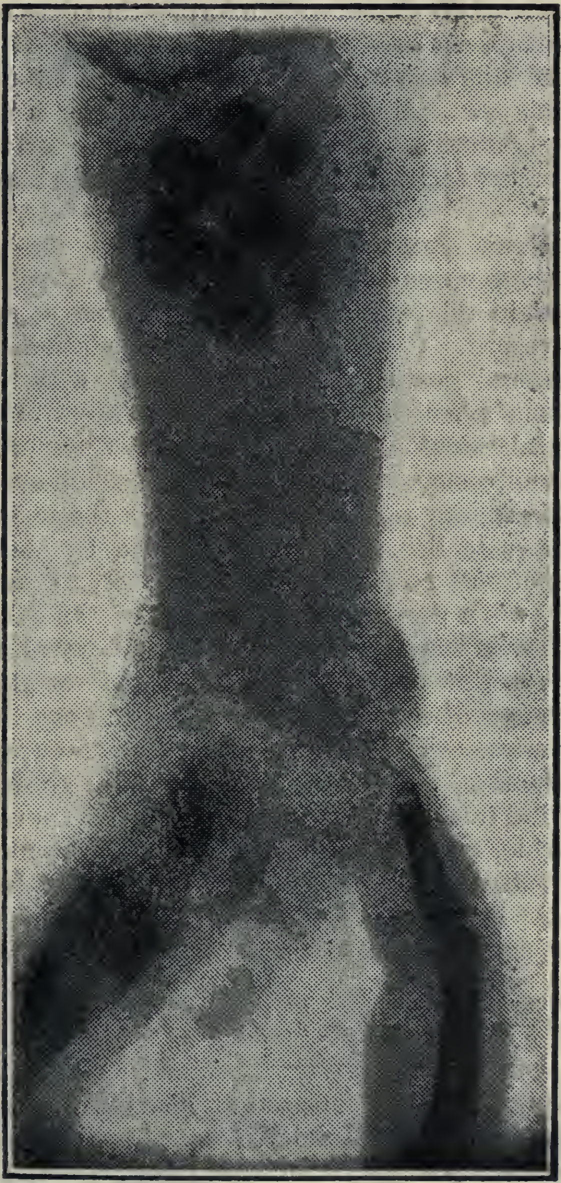
A CASE OF MULTIPLE FACETTED CALCULI OF THE PENILE URETHRA

By G. M. Manning, M.D., C.M. (McGill)

Barbados, B.W.I.

THE patient, F.C. (British descent), aged 32, had been admitted to the Barbados General Hospital in January, 1910, suffering from acute retention of urine. He had contracted gonorrhœa two weeks previously, and had neglected treatment until the day before admission, when he drank a bush tea made from the leaves of a native plant called "gully root." This decoction produces intense irritation of the genito-urinary tract, congestion, strangury, and frequently hematuria, and has a local reputation for the cure of gonorrhœa. His bladder was found distended. I passed a catheter without encountering obstruction or stone, and twenty ounces of cloudy urine were withdrawn. The patient left hospital four days later, and nothing was heard of him until January 4th, 1915, when he presented himself to be treated for a swelling of the penis just anterior to the scrotum, associated with passage of very cloudy urine. This swelling was about the size of a hen's egg, and on palpation gave the same impression as does a fowl's crop when full of Indian corn. Diagnosis was made of urethral calculi, and this was confirmed by *x*-ray examination, as shown by the accompanying *x*-ray photograph.

The patient was admitted and given a mixture containing urotropin for a few days. I operated on January 9th, and removed eleven facetted stones. On passing a catheter prior to operation a stone was encountered about midway in the penile urethra. The catheter was kept in position by an assistant, to act as a guide for the urethra, and an incision was made from the tip of this catheter downwards and in the mid line of the sac for two inches. Eleven stones were removed from a smooth-walled sac, which undoubtedly was a fusiform dilatation of the urethra. This sac was about two inches in length and, in its broadest part, one and a half inches. The corpus cavernosum was slightly altered in shape, but nearly all the bulging was lateral and anterior. A number twelve bougie was passed without obstruction, and the bladder was searched for stones, but none were found.



Skiagraph showing multiple calculi in penile uretha. Dr. Manning's case.

According to Fenwick* (Trans. Path. Soc. London, 41: 1890, 188) such multiple stones may be retained in extra-urethral sacculations. In this case there was simply a fusiform dilatation of the penile urethra containing eleven facetted calculi bathed in pus. I therefore removed the greater part of the sac, leaving a sufficient expanse of the dorsal wall to form—the edges being brought together by suture—a urethra of normal size. It is deserving of note that there was no stricture of the urethra either anterior or posterior to this sac. A number twelve catheter was passed and left *in situ* for eight days. I left the skin incision open for some little time, in case of any leakage. The patient was discharged cured on January 20th.

While isolated impacted urethral calculi are occasionally encountered, these cases of multiple formation of calculi either in sacculations or in dilatations of the urethra are so rare that each case deserves record. Cases of calculi in sacculations, if I mistake not, are in general post-scrotal, in connexion with the prostatic and membranous portions of the channel. Most of the reported cases of urethral calculus, in fact, deal with their presence in the prostatic or membranous regions. Isolated calculi are occasionally impacted in the spongy portion, sometimes in the fossa navicularis, but of multiple calculi in the spongy portion Dr. Adami tells me that he knows of only one case: there is, namely, in the Museum of St. Bartholomew's a portion of a collection of 149 calculi stated to have been removed from the middle of the spongy portion.† I can only account for this fusiform dilatation, and for the absence of occasional passage of a stone through the meatus, by supposing that a small vesical calculus became lodged in the urethra, causing a partial obstruction of the same, and that then gradual dilatation took place behind this point, so that the urethra was never completely emptied of urine, and the residual urine underwent ammoniacal fermentation with the resultant formation of these facetted phosphatic calculi. The stones are pure white, tetrahedral. I have presented the collection to the McGill Medical Museum.

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* See also Lieblein, *Beitr. z. Klin. Chirurg.*, 17, 1896, 141.

† Mentioned by Ransohoff, *Jour. Amer. Med. Assoc.*, 5, 1885, 65.

It is announced in the press that Dr. Elizabeth Garrett Anderson has been invited by Lord Kitchener to establish a military hospital of five hundred beds in or near London. The hospital will be in charge of Dr. Anderson, who has been given the military rank of Major.

Editorial

THE MEETING OF THE ASSOCIATION OF AMERICAN PHYSICIANS

THE thirtieth annual meeting of the Association of American Physicians, held May 11th, 12th and 13th at Washington, D.C., under the presidency of Dr. S. J. Meltzer, was marked by a programme of more than usual extent and interest. To those who are acquainted with the work of the Association in past years, it is no new thing to say that the papers presented at the annual meeting contain the "last word" on important researches in the fields of clinical medicine, pathology, and the auxiliary sciences, carried on during the preceding twelvemonth in the clinics and laboratories of the United States and Canada. If one were to confine one's medical reading to the bulky volume of the Transactions of the Association, one might fairly claim to be keeping abreast with the progress of medicine in the departments above mentioned.

In the short space at our disposal it is possible to give only a summary of the more important papers and the discussions to which they gave rise. A very laudable arrangement of the programme was the presentation of papers dealing with the same subject in groups, with the discussion following the reading of the last paper in the group. On the first day the most important papers and discussions centered round the topics "Circulation" and "Duodenum." Dr. Theodore C. Janeway gave a very clear résumé of the important contributions to clinical medicine during the past thirty years from the study of human blood pressure, and Dr. Alfred E. Cohn, who was present by invitation, discussed the present status of the electrocardiographic method in clinical medicine, illustrating his paper by diagrams showing electrocardiographic tracings of the more important disturbances of cardiac functions. In the discussion which followed Dr. L. F. Barker emphasized the fact that electrocardiography had been of very great value in elucidating cardiac disturbances and particularly complicated and obscure forms, but stated that it was a method reserved for experts and that it could not become a routine method of examination by practitioners. There was a specially large attendance to hear the papers and discussion on "Duodenum," all the more as Dr. William J. Mayo had been invited to give his views. His contribution on "Chronic Duodenal Ulcer" summarized the experience of the "Mayo Clinic" in regard to the frequency of this condition, its symptomatology, and its surgical treatment. He first drew attention to the earlier misleading post-mortem statistics, and to the infrequency of a clinical diagnosis, of duodenal ulceration, which was often wrongly diagnosed as gastric ulcer, nervous dyspepsia, or hyperchloridria. Operating room findings, he claimed, had revolutionized our knowledge on this point, and had proved that the majority of ulcers which had been called pyloric were really duodenal—73 per cent. duodenal, and 27 per cent. gastric in his clinic. In diagnosis "history is the most important diagnostic feature, the roentgenogram second, the physical diagnosis including the use of the stomach tube third, and laboratory diagnosis a poor fourth." Disease of the gall bladder or of the appendix may also be present, blurring the picture and necessitating a differential diagnosis at the operating table. He finds the test for occult blood unreliable. Gastroenterostomy is the operation of choice, but only if the ulcer can be demonstrated should this operation follow exploration. Blockage of the pylorus is usually unnecessary. Recurrences are mostly due to improper technique. A startling statement he makes is that he has cut off more than one hundred gastroenterostomies which had been made for symptomatic ulcer where he had been unable to find evidence that there was or ever had been one—a sad reflexion on indiscriminate surgical intervention. The other side of the picture was shown by Dr. B. W. Sippy in the "Medical cure of gastric and duodenal ulcer by means of efficient removal of gastric juice corrosion." Basing his views on the idea that a gastric or duodenal ulcer, like any other ulcer, will heal spontaneously if not subjected to intermittent or constant irritation, the irritant in this case being free hydrochloric acid, he claims, from an experience of twelve years, that a cure can be obtained by maintaining an accurate neutralization of all free hydrochloric acid during the entire time that food and its accompanying secretions are present in the stomach. Excessive nocturnal secretion is also to be controlled. Practically this is obtained by frequent feedings and the use of alkalies in carefully regulated but adequate quantities. He even maintains that recurrent duodenal ulcer in which a high grade of obstruction has developed, from spasm, or inflammatory swelling, and even when actual anatomical narrowing from indurated tissue is present, has yielded completely to such treatment. Dr. F. W. White's paper on "Observations on the use of the duodenal tube for diagnosis and treatment" demonstrated the value of this procedure in certain cases. In diagnosis it has been found most useful in diseases of the pancreas and in chronic jaundice. The procedure requires half an hour in most cases and is as safe as the use of the stomach tube. In treatment it has been used in a few cases of peptic ulcer, and in persistent vomiting of nervous or toxic origin. It is superior to rectal feeding. A thermos bottle as reservoir and the Murphy drop method are employed.

Many of the papers on "blood" topics were extremely interesting but too technical for a short review, expecially the laboratory researches of Dr. J. J. Abel on "Plasmaphaeresis," and Dr. P. Rous's paper on "The preservation in vitro of living erythrocytes." Dr. E. Libman's contribution, "Clinical studies in blood transfusion," gave rise to considerable discussion, Dr. R. C. Cabot stating that he had had good results from splenectomy in pernicious anæmia, while

Dr. Janeway favoured transfusion. Of the papers on "Serum" that of Dr. M. Nicoll, Jr., on "The treatment of tetanus with antitoxin given intraspinally" was a model of clearness and most convincing, the results being far ahead of any hitherto obtained. This paper will no doubt be published in some current medical journal and should be consulted for the details of the treatment. Dr. Rufus Cole's paper on "The treatment of acute lobar pneumonia by specific methods" was rather disappointing from the therapeutic standpoint, though entirely satisfactory as regards the classification of the varieties of the pneumococcus and the bearing of this on prognosis.

The second day was devoted mainly to "Nephritis," "Diabetes," and "Thyro-toxicosis." Of the papers on the last-named topic probably the most interesting was "The isolation in crystalline form of the iodine-containing compound occurring in the thyroid" by Dr. E. C. Kendall (by invitation), who showed electrocardiographs demonstrating the effect of this compound on the circulation in cases of myxœdema, and also large photographs of a cat showing exophthalmos and emaciation from injections of the same substance. Dr. H. A. Christian presented for himself and a number of co-workers a series of "Studies of nephritis," including the use of "renal test-meals," "diuresis in relation to diuretics," and "functional diagnosis." The main drift of the papers on diuresis was that diuretics are of little use except in such cases of renal insufficiency as are associated with cardiac disease. Diuresis resulted mainly from digitalis and forced fluids. Where there was no œdema there was no diuresis. Dr. Christian thinks little of Widal's classification of the nephritides. Dr. S. W. Lambert's paper on the "Treatment of poisoning by bichloride of mercury" was eminently practical. He advocates, in the first stage, gastric lavage with exhibition of antidote, and, in the second stage, prolonged use of the continuous rectal absorption by drip method of solutions of potash diuretics; daily lavage of stomach and colon until cessation of secretion of mercury by stomach and intestines.

It is not too much to say that the contribution of Dr. F. M. Allen on "Long fasting in diabetes," and of Dr. E. P. Joslin on "Present day treatment and prognosis in diabetes" aroused more interest than any other papers presented at this meeting. It is quite true to state that they will revolutionize the dietetic (and only satisfactory) treatment of this disease by immensely shortening its duration, and by rescuing from impending coma many an apparently desperate case. These papers must be read in full if one wishes not only to grasp their full significance but properly to carry into practice the lessons they teach. They are based on careful experimental work, and the results are so satisfactory that it should be the duty of every physician who pretends to treat diabetes seriously to become familiar with the method. In the discussion which followed there was a pretty passage of arms between the writers and a certain well-known Chicago clinican and consultant, in which the latter, who claimed priority in this method, certainly came off second best.

The Annual Association Dinner was marked by the ovation given to the oldest member, Dr. Abraham Jacobi, "the Nestor of American medicine," who, notwithstanding his eighty-odd years took part in the discussions and made one of the wisest and wittiest speeches ever heard at an Association dinner.

THE USE OF ASPHYXIATING GASES

IN one of H. G. Wells' earlier novels—"The War of the Worlds"—the invaders from Mars utilized a poisonous, heavier-than-air gas as a means of overcoming their opponents on earth. In a later novel by the same writer—"The War in the Air"—it is suggested that Germany would be the first nation to break the solemn agreements of the Hague Conference. But it was incredible that a civilized nation, whom many of us thought to be a humane people, would combine both of Wells' suggestions. German honour was already a discounted national asset and now we learn that German humanity—for the whole nation and not this or that general is responsible for the crime—is a figment of the imagination. The Germans at Ypres have undoubtedly used means of overcoming the Allies impossible to honourable and humane men.

From the naturally confused and "telegraphic" communications received it is difficult to be certain exactly what gas has been used. Accounts differ as to its colour, and newspaper reports suggest chlorine, bromine chloride or bromine as the noxious agent. In view of the ease with which chlorine can be transported and disengaged it is probably that gas which has been used, and not compounds of chlorine, such as the bromide, the oxides, or the iodides, or the element bromine. All these give off irritating vapours much heavier than air and the symptoms produced by breathing them are much the same as in the case of chlorine. But chlorine is a gas at ordinary temperatures two and a half times heavier than air and easily liquefied under a pressure of 16·5 atmospheres, in which form it is put up in steel cylinders as a commercial article. One has to assemble but a few such cylinders comparatively, to obtain at a moment's notice large volumes of poisonous gas, which, clinging to earth by its great weight, will drift with the prevailing breeze and, even at a dilution of 1·5 parts per thousand of air, bring death to any living thing in its path.

Nor is the death a sudden and painless death, as hypocritical articles in German newspapers will have us believe. In very small doses it first produces a temporary cessation of breathing reflexly through irritation of the nasal mucous membrane. Next, when this inhibition of necessity ceases, the gas is drawn into the other respiratory passages and, on account of its solubility in moisture, it attacks the respiratory mucous membranes, producing violent catarrh. The later sequelæ are results of the disintegration of these membranes caused either by direct union of the chlorine with their proteins or by the formation of hypochlorous and hydro-chloric acids and the evolution of nascent oxygen. There is frequently a purulent discharge, with inflammation, bronchitis, hæmorrhage, and broncho-pneumonia. All these symptoms have been observed in rescued soldiers. The sufferer may die before pneumonia ensues and, in the case of considerable concentration of the gas (over one in a thousand), dyspnœa, coma and death rapidly follow.

We can thus see that the employment of chlorine, in addition to the dishonour of its use, is as inhuman as it could well be. It will probably be many years before representatives of the German nation are again admitted to a Hague Conference.

But meanwhile what is to be done? Can we bring ourselves to imitate the methods of the enemy? To blow steam or atomized water from a spray into the fumes may be effective but it is to be remembered that chlorine water blisters the skin and causes acute inflammation of the conjuctiva. A combination of wet respirators and water sprays would be useful and a means of creating a violent up-draught of air some distance in front of the trenches, by means of burning gasoline or kerosene, would so dilute the cloud of vapour as to render it less noxious. Meanwhile we can take some comfort in the thought that it is but rarely that atmospheric conditions will render the use of this diabolic means of warfare possible. Already, if we can believe reports, our enemies have been caught in their own trap.

A CONTRIBUTION of $12,500 has been made by the Canadian Red Cross Society towards the equipment of a Canadian ward in the hospital now being provided at the front by the Order of St. John of Jerusalem. The medical and nursing staffs of the ward will consist of Canadians and the cost of their salaries and transportation will be met by the Canadian Red Cross. The first unit sailed from Canada on April 21st.

A mobile laboratory has been provided by the War Office for service with the Canadian Expeditionary Force. The laboratory which recently arrived in France, consists of a motor lorry with the most modern and complete laboratory equipment, and an automobile for the use of the staff. Lieutenant-Colonel G. G. Nasmith, of Toronto, is in charge of the laboratory; he is assisted by Dr. Rankin, provincial bacteriologist for the province of Alberta, and Dr. Arthur Ellis, of Toronto.

Typhus fever is said to be prevalent in the German camps, where there are British prisoners of war, at Hamburg, Zossen, Altdamm, Schneidermuhl, Cardelegen, Langensalza, Wittenburg, Zerbst, Sagan, Cassel, and Chemnitz. Professor George Cornel, so well known for his research work on tuberculosis, Professor Stanislaus von Prowazek, head of the Zoological Department of the Hamburg Seaman's Hospital and Institute for Tropical Diseases, and Professor Löffler, are said to have died of the disease.

The sympathy of the profession goes out to Lieutenant-Colonel Ryerson in his bereavement. His eldest son, Captain George B. Crowther Ryerson, who was in his thirty-third year, was killed in the battle of Ypres; another son, Lieutenant Arthur G. Connaught, was wounded in the same battle; and Mrs. Ryerson, who was on her way to visit Lieutenant Ryerson in hospital in London, lost her life on the ill-fated *Lusitania*; fortunately, Miss Ryerson, who accompanied her mother, was rescued.

An offer was made recently by Dr. John B. Murphy, of Chicago, of a hospital of 1,040 beds for service in England or with the British army at the front. The offer has been accepted by the War Office and the personnel is being recruited at once under the direction of Dr. James M. Neff, who will command the unit. The staff will consist of thirty-two medical men, including three surgeons, one consulting physician, a radiographer, a clinical pathologist, an ophthalmic surgeon, and a specialist in diseases of the ear, nose and throat, and 75 fully qualified nurses. Dr. Philip S. Chancellor will accompany the hospital as consulting surgeon, and among the members of the staff will be Drs. John Edward Kelly and John G. O'Malley. An offer has also been made by Dr. William Potter, President of the Jefferson Medical College, Philadelphia, to supply the personnel of a hospital of 1,000 beds for service in France or Belgium, the staff to consist of thirty physicians and surgeons with the necessary complement of nursing sisters.

It has been suggested that the period during which members of the profession offer their services should be shortened and that a practitioner should be allowed to volunteer for six months instead of for three years or for the duration of the war. The profession has amply shown its willingness to do the utmost in its power to help at the present crisis, but there are many practitioners who do not feel justified in risking the loss of a practice that perhaps has taken years to work up, and who, in short, cannot afford to volunteer for such a length of time, unless some reasonable provision is made to enable them to reëstablish themselves in practice when their services in England or at the front are no longer required. This matter was discussed at some length at the meeting of the Council of the British Medical Association on April 28th, last, and "the opinion was expressed that the Government should itself take action to guarantee, not only proper salaries, but reasonable compensation for disturbance. A sum of £1,000 was placed at the disposal of the Chairman of Committees for the purpose of defraying any expense in connexion with steps which the Association may take to bring the matter fully to the notice of the profession and of the Government."

At the beginning of May the Canadian troops numbered 108,760; this included those at the front and those in training. The total casualties amongst the British forces, up to April 11th, were stated to number 139,347; those in the Canadian division, up to May 2nd, numbered 232 officers and 6,024 men, and since the battle of Langemarck the casualties reported number about 8,000. The lists of wounded which appear in the press daily are sufficient evidence that Canada has taken her share of the sacrifice and provision must be made for the wounded when they return. A committee has been appointed to make the necessary arrangements. Offers of private residences to be converted into convalescent homes have been received as was noted in the last issue of the Journal. In addition to those mentioned, an offer has been received from Mr. W. B. Northrup, M.P., of his residence at Belleville, and one from Mrs. J. K. L. Ross, of Montreal, of her house at Sydney, Nova Scotia; the latter has been converted into a hospital of fifty beds. Mrs. Gordon Strathy, Jr., has also offered her house at Senneville, Que., and at St. John, New Brunswick, the residence of the late John H. Parks has been offered by his daughters.

The splendid spirit of patriotism shown by members of the profession since the commencement of the war shows no abatement. There are now about four hundred Canadian doctors on active service and the recent appeal of the War Office for more volunteers has stimulated the profession to fresh efforts. From every part of the country come offers of service. In addition to those already mentioned in the Journal, the physicians of Vancouver, through Lieutenant A. S. Monroe, who is in command of the local unit of the Canadian Army Medical Corps, have offered to supply the staff of a military base hospital of 1,040 beds. The province of Saskatchewan has volunteered to supply a hospital and the physicians of Hamilton are considering a similar offer. The personnel of a base hospital of 250 beds was offered by the University of Alberta but has been refused, as was the offer of a base hospital from Laval University; the latter, however, has since been accepted. A stationary hospital for service in France has been offered by the University of Manitoba, and a similar offer was made some time ago by the University of Dalhousie. It is announced also that the Western University, London, Ontario, intends to offer a hospital unit to the Dominion Government. The Lambton County Medical Association is willing to supply a stationary hospital when required. At present the war office needs individual doctors rather than more hospitals.

A FEW weeks ago, Dr. George E. Armstrong, of Montreal, received a request from Dr. DePage, the eminent Belgian physician and founder of the hospital at LaPanne, near Dunkirk, for a number of nurses to assist in the hospital. Although no remuneration was offered, more than the number required volunteered their services, and twenty-two were chosen by Dr. Armstrong assisted by Dr. Reddy, who took an active part in organizing the party. The equipment was provided by individual contributions, as were also over twenty cases of surgical dressings, sterilized and ready for immediate use, which the nurses took with them. The party has already arrived at LaPanne, which is just within the Belgian border. Madame DePage lost her life on the *Lusitania;* she had just completed a course of lectures in the United States and had collected $115,000 for the Belgian Red Cross Society. Professor DePage founded the International Surgical Society; he was secretary of the three congresses held in Brussels in 1905, 1908 and 1911, and in the work of organization was ably assisted by his wife. Madame DePage accompanied her husband to England in 1908 when he attended the annual meeting of the British Medical Association, and in 1913 on the occasion of the International Medical Congress in London. In April, 1914, when the International Surgical Society met in the United States, Professor DePage was chosen its president and Madame DePage accompanied him. A desire has been intimated that a memorial be set up to her in England and it is probable that British surgeons will take some steps to this end.

The appointment of Professor Adami to the Committee charged with the compilation of a medical history of the British Expeditionary Forces engaged in the present war was mentioned in the May issue of the Journal. The Committee, under the presidency of the Director-General of the Army Medical Service, has been formed to consider the lines upon which the history should be laid down and to provide the necessary co-ordinating authority for the proposed work. It is intended that historical and statistical details of the work of the Army Medical Service and its adjuncts shall be recorded and an account given of the researches which are being made in connexion with the maintenance of the health of the military forces, the treatment of the wounded, and the diseases of military importance. Both military and civil members have been appointed for each of the chief subdivisions of the work, except in the case of the section of hygiene, for which both members are military. Authority has been given to members of the committee to elect for the various sections persons whose knowledge and experience will be of value. Lieutenant-Colonel Adami is the representative for Canada. The constitution of the committee is as follows:

Medicine:—Lieutenant-Colonel O. L. Robinson, R.A.M.C., and Professor Sir William Osler, Bart., M.D., F.R.S.

Surgery: Lieutenant-Colonel E. M. Pilcher, D.S.O., M.B., F.R.C.S., R.A.M.C., and Colonel F. F. Burghard, M.D., M.S., F.R.C.S.

Pathology and Bacteriology: Colonel Sir William B. Leishman, C.B., F.R.C.P., K.H.P., F.R.S., and Captain F. W. Andrewes, M.D., F.R.S.

Statistics: Lieutenant-Colonel H. P. W. Barrow, R.A.M.C., John Brownlee, M.D., D.Sc., and Lieutenant-Colonel W. N. Barron, M.V.O., R.A.M.C.

Hygiene and Sanitation: Colonel W. H. Horrocks, M.B., K.H.S., and Lieutenant-Colonel W. W. O. Beveridge, D.S.O., M.B., R.A.M.C.

Historical and Secretarial: Captain F. S. Brereton, R.A.M.C., and W. M. Fletcher, M.D., Sc.D., F.R.S.

THE news of the safe arrival in England of SS. *Northland* and SS. *Metagama* was received with great relief, for a certain amount of nervousness had been engendered by the loss of the *Lusitania*. The *Northland* and *Grampian* arrived at Bristol with a complement of some 3,700 troops. On the *Northland* were the 4th, 5th and 6th field ambulances, No. 2 clearing hospital, in command of Lieutenant-Colonel G. S. Rennie, and No. 3 stationary hospital. The *Metagama*, which sailed from Montreal on May 6th, carried the McGill General Hospital (No. 3), in command of Lieutenant-Colonel H. S. Birkett, the French-Canadian Stationary Hospital (No. 4), in command of Lieutenant-Colonel Arthur Mignault, and No. 5 Stationary Hospital supplied by Queen's University, in command of Lieutenant-Colonel Etherington. The University of Toronto Base Hospital (No. 4), in command of Colonel J. A. Roberts, sailed a few days later on the *Corinthian* and reached England in safety.

These hospitals, with those already established in France, are under the direction of the Canadian Army Medical Corps. The Canadian hospitals now in France comprise one at Wimereux, containing 300 beds, in command of Major McKee; one at Le Touquet, under Colonel A. T. Shillington, of Ottawa; and one of 1,014 beds at Le Tréport, in command of Lieutenant-Colonel Bridges. The military hospital at Dinard has 100 beds and is in command of Hon. Philippe Roy, Canadian Commissioner in Paris. The funds—$100,000—for this hospital were given to the French War Office by the Canadian Government. In addition there are the hospitals on the lines of communication, and accommodation for 3,000 beds is being provided at Etaples for the hospitals to be staffed by the Universities Contingent. In England, No. 1 General Hospital, which accompanied the first contingent of the Canadian Expeditionary Forces, was established with headquarters at Bulford, under Colonel Murray Maclaren, the President of the Association. A letter from Doctor Finley, who is chief of the medical staff of this hospital, appears on another page of this issue. The Canadians have been moved from Salisbury Plain to Shorncliffe and the hospital at Bulford has been closed gradually and another has been established at Shorncliffe. No. 1 General Hospital is now stationed at Etaples. The Queen Mary Hospital at Shorncliffe, near Folkeston, Kent, and the Duchess of Connaught Hospital at Cliveden, Bucks, are both Canadian hospitals intended principally for Canadian soldiers. They are supported by subscription and the Canadian Red Cross Society is responsible for the upkeep and equipment of the Duchess of Connaught Hospital, which is under the command of Lieutenant-Colonel Gorrell, of Ottawa. The hospital at Shorncliffe is in command of Colonel Donald Armour and the staffs at both of these institutions are composed of Canadian doctors for the most part. In addition, Surgeon-General Carleton Jones is establishing convalescent homes for Canadian soldiers at Shorncliffe and in Kent, and it is announced in the press that Mrs. S. H. Fleming, of Ottawa, with the assistance of the Minister of Militia and General Jones, intends to convert Clayton Priory, near Brighton, into a convalescent home with accommodation for twenty patients. English soldiers are given two weeks' furlough during convalescence and, of course, go to their own homes, but in the case of the Canadians and other troops from overseas, homes must be provided for their reception during convalescence.

THE following additional subscriptions have been made to the Fund for the Relief of Belgian Physicians and Pharmacists: Dr. W. E. Plummer, $5.00; Dr. L. G. Pinault, $5.00; Dr. L. M. Curren, $5.00; Dr. J. A. Guy, $5.00; Dr. M. Ayer,

$10.00; Dr. Duvernet Jack, $2.00; Dr. W. D. Rankine, $25.00; Dr. E. A. Legace, $5.00; Dr. W. M. Deinstadt, $10.00; Dr. F. D. Welson, $1.00; Dr. J. A. Langis, $5.00; Dr. B. D. Dash, $1.00; Dr. H. E. Gilmour, $5.00; Dr. A. S. Lamb, $3.00; Dr. J. A. Casswell, $10.00; Dr. J. M. Baxter, $5.00; Dr. H. W. Schwartz, $5.00; Dr. A. B. Atherton, $10.00; Dr. Jas. Bearisto, $5.00; Dr. G. C. Vanwart, $10.00; Dr. W. J. Weaver, $5.00; Dr. S. F. A. Wainwright, $5.00; Dr. H. H. McNally, $10.00; Dr. D. C. Malcolm, $5.00; Dr. G. H. Field, $5.00; Dr. T. C. Lapp, $4.00; Dr. H. M. Harrison, $1.00; Dr. J. R. Irwin, $5.00; Dr. J. A. Ivey, $4.00; Dr. E. W. Hayden, $2.00; Dr. G. C. Kidd, $2.00; Mr. C. G. Johns, $5.00; Mr. A. J. Gould, $2.00; Mr. H. G. Paton, $2.00; Mr. A. W. H. Semple, $2.00; Dr. R. E. Valin, $10.00; Dr. F. P. Quinn, $5.00; Dr. E. G. Quesnel, $2.00; Dr. R. K. Paterson, $10.00; Dr. Elisabeth Embury, $2.00; Dr. R. Chevrier, $10.00; Saskatoon Pharm. Assn., $500.00; Dr. J. F. Argue, $10.00; Dr. D. M. Robertson, $10.00; Dr. R. Law, $5.00; Dr. A. S. McElroy, $10.00; Dr. T. H. Leggett, $10.00; Dr. F. W. Mohr, $5.00; Dr. I. G. Smith, $5.00; Dr. W. F. Mayburry, $10.00; Dr. C. H. Brown, $5.00; Dr. C. E. Preston, $5.00; Dr. Warren S. Lyman, $5.00; Dr. Evans, $5.00; Dr. M. H. Reynolds, $5.00; Sir James Grant, $10.00; Dr. J. D. Courtenay, $25.00; Dr. Hugh Fleming, $5.00; Dr. G. S. McCarthy, $10.00; Dr. H. B. Moffatt, $5.00; Dr. R. W. Powell, $5.00; Dr. T. A. Watterson, $5.00; Dr. C. Laidlaw, $5.00; Dr. J. T. Basken, $5.00; Dr. C. T. Ballantyne, $5.00; Dr. J. S. Nelson, $10.00; Dr. R. E. Webster, $25.00; Dr. R. S. Minnes, $10.00; Dr. J. L. Chabot, $25.00; Dr. D. T. Smith, $25.00; Dr. J. R. O'Brien, $25.00; Dr. E. M. Lambert, $25.00; Dr. E. Bourque, $3.00; Dr. R. H. Ellis, $10.00; Dr. S. M. Nagle, $5.00; Dr. R. H. Parent, $5.00; Dr. H. L. Sims, $5.00; Dr. J. H. Laidlaw, $2.00; Dr. G. E. Booth, $3.00; Dr. R. M. Coulter, $10.00; Ottawa Medical Chirurgical Society, $50.00; St. Thomas, per Dr. Lawrence, $119.00.

The following contributions have been received from members of the Montreal Medico-Chirurgical Society up to May 10th, 1915, the total amount being $1,246.00.

Anonymous, $250.00; anonymous, $250.00; Mrs. Robert Reford, $100.00; Dr. L. L. Reford, $100.00; Sir Thomas G. Roddick, $50.00; Dr. W. G. M. Byers, $25.00; Dr. C. H. White, $25.00; Dr. W. F. Hamilton, $25.00; Dr. Alfred T. Bazin, $25.00; Dr. A. C. Garrow, $20.00; Dr. D. F. Gurd, $10.00; Dr. R. Ashton Kerr, $10.00; Dr. H. B. Cushing, $10.00; Dr. H. Oertel, $10.00; Dr. D. M. M'Kenty, $10.00; Dr. H. Muckleston, $10.00; Dr. C. K. Russel, $10.00; Dr. H. A. Sims, $10.00; Dr. J. C. Tull, $10.00; Dr. D. J. Evans, $10.00; Dr. H. L. Reddy, $10.00; Dr. J. G. McCarthy, $10.00; Dr. W. Dorion, $10.00; Dr. W. Grant Stewart, $10.00; Dr. C. M. von Eberts, $10.00; Dr. J. M. Elder, $10.00; Dr. C. S. Cross, $10.00; Dr. A. W. Haldimand, $5.00; Dr. J. L. Hargrave, $5.00; Dr. W. Jamieson, $5.00; Dr. G. Mundie, $5.00; Dr. F. T. Tooke, $5.00; Dr. C. F. Moffatt, $5.00; Dr. J. M. Rogers, $5.00; Dr. M. E. Abbott, $5.00; Dr. E. Nagle, $5.00; Dr. J. A. MacMillan, $5.00; Dr. A. de J. White, $5.00; Dr. A. E. Orr, $5.00; Dr. H. B. Carmichael, $5.00; Dr. J. A. MacDonald, $5.00; Dr. H. L. Laidley, $5.00; Dr. A. D. Stewart, $5.00; Dr. C. W. Vipond, $5.00; Dr. Thos. Cotton, $5.00; Dr. C. K. P. Henry, $5.00; Dr. A. R. Pennoyer, $5.00; Dr. A. H. Gordon, $5.00; Dr. W. L. Smythe, $5.00; Dr. W. L. Barlow, $5.00; Dr. Wm. G. Morrow, $5.00; Dr. R. E. Powell, $5.00; Dr. W. G. Hepburn, $5.00; Dr. R. B. Malcolm, $5.00; Dr. Geo. Fisk, $5.00; Dr Robt. Craig, $5.00; Dr. C. C. Gurd, $5.00; Dr. F. H. Hackett, $5.00; Dr. A. D. Irvin, $5.00; Dr. R. Kerry, $5.00; Dr. Fred. Gilday, $5.00; Dr. W. G. Reilly, $5.00; Dr. A. Schmidt, $3.00; Dr. J. D. O'Connor, $3.00; Dr. J. A. Nutter, $3.00; Dr. G. T. Ross, $3.00; Dr. Bromley Moore, $2.00; Dr. Jas. Perrigo, $2.00; Dr. J. J. McGovern, $2.00; Dr. L. S. Foster, $2.00; Dr. J. Mullally, $2.00; Dr. J. M. Fry, $2.00; Dr. G. Gellatly, $2.00.

Book Reviews

Origin and Nature of the Emotions. By George W. Crile, M.D. Edited by A. F. Rowland. Philadelphia and London, 1915. Price, cloth, $3.00 net.

The first paper, entitled "Phylogenetic Association in Relation to Certain Medical Problems," is a summary of the results obtained from a large number of observations both experimental and clinical. These researches lead the author to conclude that in operations under inhalation, anæsthesia nerve impulses from the trauma reach the brain and bring about a physiological exhaustion and pathological change in the nerve cells. Fear in a similar way acts on the brain cells. This useless and harmful expenditure of energy may be avoided in operations by blocking the paths by which such impulses are transmitted. In another address, "Phylogenetic Association in Relation to the Emotions," the author notes that the principal phenomena of fear result from a suspension of all the functions of the brain except those that have to do with the defence of the body; only those impulses which stimulate the motor mechanism reach the brain. A similar picture is seen in Graves' disease; here there is secreted an excessive amount of some substance that activates the motor mechanism; in both instances emotional exhaustion is a consequence. The mechanism which produces pain causes laughter and crying; all three are phenomena which result from a stimulation to motor action. The pain of certain infections is necessary to keep at rest the part infected; where such fixation is not needed there is no pain. This difference is well seen in the painless exanthemata and the pyogenic infections. Emotional excitation is a primitive biological reaction for the good of the individual and has its origin in the laws of evolution. The purpose of another paper is to give the results of certain researches which show certain relations between alterations in brain functions and physical changes in the brain cells: fear, fatigue, insomnia, can lead to such changes.

In "A Mechanistic View of Psychology" Dr. Crile maintains that environment is the actual creator of man and that the human body mechanism is equipped to preserve the individual and to propagate the species.

In "A Mechanistic Theory of Disease" he postulates that the body is a mechanism responding to the stimuli given to it from without of the environment of the present, and from within by the environment of the past the memory of which is stored up in the brain. There is a long paper on "The Kinetic System" by which is meant a system evolved primarily for the transformation of latent energy into motion and into heat. It is by means of such a system that animals adapt themselves to their environment; and the organs serving this purpose are the brain, adrenals, thyroid, muscles and liver. Each organ is essential and cannot be compensated for. Such a conception explains many diseases, and may lead to a newer and more effective therapy.

The book closes with a short paper on alteration in the hydrogen ion concentration of the blood, with observations on a variety of conditions presenting a diminution in its alkalinity. This increase in the acids of the blood may explain the anæsthesia of ether, and may be actually the final cause of death.

(SWANZY'S) HANDBOOK OF THE DISEASES OF THE EYE AND THEIR TREATMENT. Eleventh edition. Edited by LOUIS WERNER, M.B., F.R.C.S.I., Dublin University. H. K. Lewis, London, 1915. Price 12s. 6d. net.

This is a new edition of a well-known handbook; the first edition since the death of Sir Henry Swanzy in April, 1913, at the age of seventy. It is interesting at this time to recall the fact that Sir Henry Swanzy served as surgeon with the Prussian army in 1866. In the preface to the tenth edition it is stated that the book is mainly intended for the use of students. There is, perhaps, however, a little too much in it for the average student; but it is an admirable book for the general practitioner, and well worth a place on his shelves. The subject-matter has been brought thoroughly up to date, and especially so in the chapter on glaucoma. The so-called "Eliot operation" of trephining for glaucoma is described in detail and there is a good illustration of the Schiötz tonometer with a full account of its use. The chapter on refraction is clear and concise; the following remarks under the heading "The Management of Myopia" are worth noting: "Practical experience is here even more valuable than theory, and it shows that in a large majority of those patients whose short sight has been fully corrected in youth, and who have worn their spectacles constantly for a number of years, the myopia in many instances has not increased at all, while in a large proportion the increase will have been moderate, and in but a small proportion, marked pernicious progress will be noted. In short, the tendency to increase of the myopia, and to organic disease, is less than in those myopes who have either worn no glasses or but partially correcting glasses."

In discussing chronic iritis, affections of the teeth are referred to as a possible cause, a fact which is often overlooked. The book is well got up and the coloured illustrations are above the average.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

PRACTICAL HANDBOOK OF SURGICAL AFTER-TREATMENT. By ALAN H. TODD. Arnold, London, 1915. Illustrations and tables. Price 4s. 6d. net.

PRACTICAL MEDICINE SERIES. Edited by C. L. MIX. Chicago: Year Book publishers, 1915. VOLUME I. GENERAL MEDICINE. Edited by FRANK BILLINGS and J. H. SALISBURY. Price $1.50.

TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By JOHN GLAISTER. Third Edition. Illustrations and coloured plates. E. and S. Livingstone, Edinburgh, 1915. Price 15s. net.

TEXT-BOOK OF PUBLIC HEALTH (Late HUSBAND'S). By E. E. HOPE. Eighth edition, revised and enlarged. E. and S. Livingstone, Edinburgh, 1915. Price 5s. net.

THE ACUTE ABDOMEN. By WILLIAM HENRY BATTLE, senior surgeon to St. Thomas's Hospital. Second edition, enlarged and illustrated. Toronto: The Macmillan Company of Canada, Limited, 1914.

POSOLOGICAL TABLES. APPENDIX ON POISONS: INDEX OF DISEASES AND MEDICINES ARRANGED ACCORDING TO THEIR ACTIONS. By WILLIAM CRAIG, M.D., C.M., F.R.S.E., F.R.C.S. Fourth edition. Edinburgh: E. & S. Livingstone, 1915.

THE CURATIVE ACTION OF RADIUM. By DR. SIGM. SAUBERMANN, Charlottenburg. New York: Radium Limited.

ACUTE ABDOMEN. By WILLIAM HENRY BATTLE. Senior surgeon to St. Thomas, Hospital. Second edition, enlarged and illustrated. Macmillan, Toronto, 1914.

BLOOD PRESSURE IN MEDICINE AND SURGERY; A GUIDE FOR STUDENTS AND PRACTITIONERS. By EDWARD H. GOODMAN, M.D., associate in medicine in the University of Pennsylvania. Lea and Febiger, Philadelphia and New York, 1914. Price, $1.50 net.

CANCER, ITS CAUSE AND TREATMENT. By L. DUNCAN BULKLEY, A.M., M.D., senior physician to the New York Skin and Cancer Hospital. Hoeber, New York, 1915. Price, $1.50 net.

(SWANZY'S) HANDBOOK OF THE DISEASES OF THE EYE AND THEIR TREATMENT. Eleventh edition. Edited by LOUIS WERNER, M.B., F.R.C.S.I., Sen. Mod. Univ. Dublin. H. K. Lewis, London, 1915. Price 12s. 6d. net.

ESSENTIALS OF MEDICAL ELECTRICITY FOR MEDICAL STUDENTS AND NURSES. By GEORGE KNAPP ABBOTT, A.B., M.D., professor of clinical medicine, College of Medical Evangelists, Loma Linda, California. W. B. Saunders, Philadelphia and London, 1915. Price, $1.25. Canadian agents: J. F. Hartz Co., Ltd., Toronto, Ont.

INFECTION AND IMMUNITY, A TEXT-BOOK OF IMMUNOLOGY AND SEROLOGY. Third edition, revised and enlarged. By CHARLES E. SIMON, B.A., M.D., professor of clinical pathology and experimental medicine, College of Physicians and Surgeons, Baltimore. Lea and Febiger, Philadelphia, 1915. Price, $3.25 net.

LEPER HOUSES AND MEDIÆVAL HOSPITALS; BEING THE FITZPATRICK LECTURES DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS, LONDON, 5TH AND 10TH OF NOVEMBER, 1914. By CHARLES A. MERCIER, M.D., H. K. Lewis, London, 1915. Price, 1s. net.

MANUAL OF THE DISEASES OF INFANTS AND CHILDREN. Fourth edition, thoroughly revised. By JOHN RUHRAH, M.D., professor of the diseases of children in the College of Physicians, Baltimore. W. B. Saunders, Philadelphia and London, 1914. Price, $2.50. Canadian agents: J. F. Hartz Co., Ltd., Toronto, Ont.

PATHOLOGICAL TECHNIQUE, A PRACTICAL MANUAL FOR WORKERS IN PATHOLOGICAL HISTOLOGY AND BACTERIOLOGY, INCLUDING DIRECTIONS FOR THE PERFORMANCE OF AUTOPSIES AND FOR CLINICAL DIAGNOSIS BY LABORATORY METHODS. Sixth edition. By FRANK BURR MALLORY, A.M., M.D., associate professor of pathology, Harvard Medical School, pathologist to the Boston City Hospital, and JAMES HOMER WRIGHT, A.M., M.D., Sc.D., pathologist to the Massachusetts General Hospital, assistant professor of pathology, Harvard Medical School. W. B. Saunders, Philadelphia and London, 1915. Price $3.00. Canadian agents: J. F. Hartz Co., Ltd., Toronto, Ont.

PYELOGRAPHY (PYELO-URETEROGRAPHY), A STUDY OF THE NORMAL AND PATHOLOGICAL ANATOMY OF THE RENAL PELVIS AND URETER. By WILLIAM BRAASCH, M.D., Mayo Clinic, Rochester, Minn. W. B. Saunders, Philadelphia and London, 1915. Price, $5.00. Canadian agents: J. F. Hartz Co., Ltd., Toronto, Ont.

SURGERY OF THE BLOOD VESSELS. By J. SHELTON HORSLEY, M.D., Surgeon in charge of St. Elizabeth's Hospital, Richmond, Va. C. V. Mosby Company, St. Louis, 1915. Price, $4.00 net.

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION. Volume XXXII. Edited by ARCHIBALD MACLAREN, M.D., Recorder of the Association. Printed for the Association, William J. Dornan, Philadelphia, 1914.

TEXT-BOOK OF MEDICAL CHEMISTRY AND TOXICOLOGY. Fourth edition. By JAMES W. HOLLAND, A.M., M.D., Sc.D., emeritus professor of medical chemistry and toxicology, and dean of Jefferson Medical College, Philadelphia. W. B. Saunders, Philadelphia and London, 1915. Price, $3.00. Canadian agents: J. F. Hartz Co., Toronto, Ont.

TRANSACTIONS OF THE ROYAL ACADEMY OF MEDICINE IN IRELAND. Volume XXXII. Edited by J. ALFRED SCOTT, M.A., M.D., F.R.C.S.I., general secretary; professor of physiology, Royal College of Physicians, Ireland. Falconer, Dublin, 1914.

WAR SURGERY. By EDMOND DELORME. Medecin inspecteur général de l'armée. Translated by H. DEMERIC, surgeon to in-patients, French Hospital, London. H. K. Lewis, London, 1915. Price 5s. net.

THE annual meeting of the Hamilton Health Association was held April 22nd. A dispensary was opened by the Association in November, 1908; at that time there were 36 patients on the visiting list of the Association; now there are 527, although some of these are no longer in need of medical attendance and only receive occasional visits. During the year ending September 30th, 1914, 2,592 patients attended at the dispensary, 2,070 visits were paid, the names of 182 patients were added to the list of those to be visited; 687 persons were examined, 214 of whom were children under fourteen years of age. In the sanatorium 201 patients were treated last year; 120 were discharged and 5 died. The building is only intended to accommodate 75 patients but at the end of April there were 94 in residence. However, the plans have been prepared for a new building which will be erected this summer. The preventorium, which is intended for the treatment of children under fifteen years of age who are suffering from tuberculosis, has already been enlarged. During the past year 71 cases received treatment; 40 were discharged and 31 were still in residence on September 30th, 1914.

Res Judicandæ

TUBERCULOSIS IN MINNESOTA

THE following communication has been received from Dr. H. W. Hill, who was formerly Director of the Institute of Public Health, in London, Ontario, and is now the Executive Secretary of the Minnesota Public Health Association:

MINNESOTA PUBLIC HEALTH ASSOCIATION
OLD CAPITOL, ST. PAUL, MINN.

Sir:

Please give the enclosed such prominence as you deem expedient in order to elicit views on and discussion of the two most crucial points in existing tuberculosis creeds,—i.e., the time of life at which, and the manner in which, infection with human tuberculosis usually occurs.

The immense practical importance of these questions to those engaged in the attempt to abolish tuberculosis is beyond dispute. Too much of the current popular teaching of to-day is inconsistent, traditional, and out of line with recent experimental work. An attempt to correlate known facts into one consistent theory is greatly needed. Should this attempt aid in achieving a consummation so devoutly to be wished, it will have attained its object.

The following questionnaire and discussion has been sent to a number of Public Health and Medical Journals and to many individuals for their consideration. Responses will be greatly appreciated.

Very sincerely yours,

H. W. HILL, M.B., M.D., D.P.H.
Exec. Sec. Minn. Public Health Assn.
Old Capitol, St. Paul, Minn.

QUESTIONNAIRE ON TUBERCULOSIS

Question 1. In your opinion is the evidence conclusive that the healed lesions, frequently reported as present in lungs of persons dying of non-tuberculous affections, are, in fact, as usually alleged, tuberculous in origin?—(*a*) In nearly all instances? Or (*b*) In a majority of instances? Or (*c*) In some instances? Please give rough estimates of the percentage of such lesions which in your opinion are tuberculous in origin. If without personal knowledge from personal investigation, please quote the authorities on which you rely.

Question 2. In your opinion is the evidence conclusive that such of these healed lesions as may be in fact tuberculous, are due to the human tubercle bacillus as distinct from the bovine bacillus? (*a*) In nearly all instances? Or (*b*) In the majority of instances? Or (*c*) in some instances? If without personal knowledge from personal investigation, please quote the authorities on which you rely.

The significance of this inquiry may be set forth thus: The data at our disposal seems to permit two related hypotheses, based on certain statements and deductions which are recorded below; but it is necessary that these statements and deductions be checked by the actual facts. Two of the points essential to a decision are brought out in the questions above. Others may suggest themselves as you read.

First Hypothesis; On Healed Lung Lesions. In view of statements, recorded immediately following, it seems evident that children are immensely more exposed to bovine bacilli than to human bacilli; that they are more susceptible to bovine bacilli when young than when older; that therefore tuberculous lesions developed in childhood and becoming arrested, or converted into scar-tissue or calcified as age increases, are more likely to be of bovine origin than of human origin. (The crucial point evidently is: Are healed-lesion bacilli human or bovine?)

Data Supporting this Hypothesis. We may take it as established (a) That bovine tubercle bacilli are ingested pretty continuously, (although in very varying amounts), by the great majority of raw-milk drinkers, who in turn constitute the great majority of the American population; that such exposure is especially great during childhood, since milk then forms a large proportion of the diet, decreasing with increasing age.

(b) That human tubercle bacilli are ingested pretty continuously (and probably in very varying amounts), by the great majority of those intimately exposed to open cases of human pulmonary tuberculosis; but that such exposed persons constitute a comparatively small fraction of the total population; and that this fraction is especially small amongst children, since childhood exposure is limited by the fact that the child associates usually with a comparatively limited circle of persons, therefore escaping intimate association with human tubercle bacilli unless some one in that limited circle is an open case of pulmonary tuberculosis. The exposure of children to human tubercle bacilli tends to increase with increasing age because the circle of association tends to grow progressively larger and because the age of those associated progressively increases. It very definitely enlarges rather suddenly at the age of entering business (14 to 22, say) because of the then definite change of the age of the associates from young people in school (with relatively little open tuberculosis) to older people in business, (amongst whom there is a much larger percentage of open tuberculosis).

Hence, it would seem evident that there are more bovine tubercle bacilli present in more human bodies of the average American population during any given period than there are human tubercle bacilli during a like period; and also that there are more bovine tubercle bacilli present in more children's bodies than adult bodies in an average American population during any given period.

(*c*) Again, we may take it as established that bovine tubercle bacilli produce clinically recognizable lesions in the lungs far less frequently than elsewhere; when such lesions occur they are nearly always in children; it seems reasonable to conclude therefore that as the age of the child increases the facility of the bacilli to develop in the body decreases* This is especially true of their facility to develop in the lung.

And that therefore bovine lesions, developed early in life, and especially in a lung, would tend to heal as age increases.

(d) It is well established that human tubercle bacilli produce clinically recognizable lesions in the lungs far more frequently than elsewhere; and that such lesions are more common in adults than in children. It would seem reasonable to conclude that increase in age of the individual may mean an increase in the facility with which the bacilli develop in the body and particularly in the lung.

And that, therefore, human lesions, developed early in life, and especially in a lung, would tend to grow worse as age increases.

Second Hypothesis; On Tuberculin Reactions: In view of statements recorded immediately following, tuberculin reactions in young children, not exposed to open cases of human pulmonary tuberculosis, are more likely to be of bovine than of human origin.

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* This may be no more than the result of acquired immunity due to the constant dosage with bovine bacilli.

Data Supporting this Hypothesis: (a) We may take it as established that the dosage with bovine tubercle bacilli is pretty continuous throughout life; that although the doses are larger in childhood, they tend to cumulate as age increases; and that this bovine infection, increasing steadily in total amount, while at the same time lessening in effective production of lesions, may explain satisfactorily the exceedingly rapid increase in prevalence of tuberculin reactions found by some investigations in non-exposed children (non-exposed to human tuberculosis) as age increases, without any need to take into account infection with the human tubercle germ. (This is in fact the exact situation amongst cattle, where infection with the human tubercle germ does not confuse the issues.) Indeed, this rapidly increasing prevalence of the tuberculin reaction does not at all parallel any correspondingly rapid increase in exposure to human tuberculosis.

(b) Notwithstanding this generally high prevalence of reaction to tuberculin amongst the population in some localities, Lampson has shown in Minnesota (a) a relatively low incidence amongst those not exposed to open human cases; (b) an excessively high incidence amongst those so exposed; and (c) an intermediate incidence (32 per cent.) amongst those associated with non-infectious human tuberculosis. His work is peculiarly valuable because it takes into account not the mere health of the individual, but the health of the associates also.

It seems, therefore, that a tenable hypothesis at present, may be thus formulated.

1. The relatively low incidence of the tuberculin reaction in healthy families may represent (1) the sum of such bovine infections (from milk) as may have existed in that family, together with (2) some casual human infection from human sources outside the family; neither of these dosages, however, being sufficiently large or continuous* to precipitate actual lesions.

2. The relatively high incidence of the tuberculin reaction in families where an open pulmonary case exists may represent (1) the sum of such bovine infection (from milk) as may have existed in that family together with (2) some casual human infection from outside of the family; but chiefly it represents (3) the very obvious, large and continuous* dosage, from the open case.

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* Continuity of dosage seems of importance to the production of infection, chiefly because it multiplies the chances of some one efficacious dose reaching and maintaining a favourable foothold. Small doses frequently repeated may tend to immunize rather than to produce lesions.

3. The intermediate incidence of the tuberculin reaction in families where non-open cases exist may be explained thus: The non-open cases, if pulmonary (and therefore probably of human origin), were evidently from the very fact of being non-open, of comparatively recent origin.* Being non-open, they could not account for the infection of their associates; being recent, the associates were probably exposed to the same source as that from which the cases contracted the disease; hence the tuberculin reactions in the associates in such instances may represent (1) the sum of such bovine infections (from milk) as may have existed in that family, together with (2) some casual infection from outside human sources, which, intermediate in dose or continuity, sufficed to produce the disease in one member but achieved only non-lesional infection amongst the remaining members. It may be noted that a similar explanation would fit where the existing case was one of non-pulmonary tuberculosis of human origin; but where the non-open case was of bovine origin, the infection of the other members of the same family from the same cow would furnish a perfectly obvious explanation.

Finally, a high incidence of tuberculin reactions found amongst children not exposed to open human tuberculosis suggests a high prevalence of tuberculosis in the milk supply.

Summary

The bovine origin of healed tuberculous lesions in human lungs and the bovine origin of tuberculin reactions in many cases, especially in children, is as reasonable an hypothesis as that now held to account for them. The present hypothesis predicates an immensely wide dissemination of the human tubercle bacillus. The validity of this hypothesis of wide dissemination has been growing less as investigation has increasingly demonstrated the limited radius of such infection from known human sources. It predicates also a wide dissemination of human tubercle bacilli to children especially, yet children, at least up to the age of fourteen, are, as shown above, peculiarly little exposed to the only important source of human tuberculosis (i.e., open pulmonary cases) as compared with adults.

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* I may state that investigations made of human tuberculosis in Minnesota along strict epidemiological lines and by trained men accustomed to trace infection in other and more acute diseases have shown that adult pulmonary tuberculosis can be directly traced in the majority of instances, clinically and epidemiologically to intimate association with preceding open pulmonary cases; such exposure occurring as a rule, not in childhood, but within a general rough average of four or five years before the open stage was recognized.

The older hypothesis that infection with human tuberculosis occurs chiefly in children but develops in adult life, after a long latent period, also based on the alleged wide dissemination of the human bacillus, appears as an unnecessarily complicated hypothesis, not fitting the actual probabilities sufficiently closely.

The consideration is offered that the older hypothesis may easily have arisen from confusing two consecutive infections of very distinct although allied bacilli, having converse histories; the first or bovine infection occurring early in life with a marked tendency to disappear, leaving slight or healed lesions, and a tuberculin reaction; the second or human infection occurring later in life with a marked tendency to develop to a fatal termination, and yielding also a tuberculin reaction. Failure to distinguish between the termination of one and the beginning of the other would be a satisfactory explanation of the development of the older hypothesis.

THE Overseas Double Company, consisting of men from the different universities, and forming D Company of the 38th Battalion, under the command of Captain Gregor Barclay, went into camp at Niagara Falls on May 2nd, for two weeks; they then joined their regiment and are in training preparatory to leaving for the front with the third contingent.

A CORPS of physicians and nurses, under the command of Dr. J. William White of the University of Pennsylvania, have left New York for Paris, where they will be attached to the American Ambulance Hospital. On May 17th last, a party of 150 physicians, sanitary inspectors, and senior medical students left Baltimore for Serbia.

AN appeal has been made by Sir Edward Grey, through Sir J. Roper Parkington, for subscriptions towards the purchase of disinfectants required in Montenegro on account of the prevalence of epidemics of typhus and typhoid fever.

Obituary

Dr. John E. McTaggart, of Detroit, died in the seventy-eighth year of his age and was buried at Ridgetown, Ontario, on May 12th. Dr. McTaggart was born at Palmyra, near Ridgetown. He graduated from Buffalo University and practised first at Marine City, then at Detroit.

Dr. Murdoch Matheson died at Waverly, New South Wales, on March 30th. Dr. Matheson, who was in the seventy-sixth year of his age, was born in Scotland. In 1849 the family came to Crinan, Ontario, and it was there that Dr. Matheson received his early education. Later he graduated from Kingston University and after practising for a short time at Alvinston, he went to Australia.

Dr. Daniel E. Berryman, of St. John, New Brunswick, died May 14th, in the seventieth year of his age.

Dr. William Case, of Hamilton, died May 16th, in the seventy-ninth year of his age.

Dr. George Clarence Gliddon, A.M.C., died May 11th of wounds received at Langemarck. Captain Gliddon was the son of Mr. John Gliddon, of Union, Ontario. He was twenty-five years of age. He graduated last summer from the University of Toronto and was attached to the tenth battalion C.E.F.

Dr. William P. Dillon, A.M.C., of Ottawa, was thrown from his horse and killed at Le Tréport, where he was stationed with No. 2 General Hospital. Major Dillon offered his services at the beginning of the war and was appointed to the staff of No. 2 General Hospital, which accompanied the first contingent of the Canadian Expeditionary Force. Dr. Dillon graduated from McGill University in 1904 and was in practice in Ottawa.

Dr. George Jerald Potts died at Clinton, Ontario, April 22nd, in the eightieth year of his age. Dr. Potts had practised both in Toronto and Belleville. As a young man, Dr. Potts joined the Canadian Militia and at the time of the Indian Mutiny was surgeon to the British Consulate in Siam; he was ordered to proceed to India and served there until order was again established. He then went to China with the Anglo-French Expedition, and at the end of the campaign joined the United States Federal forces and served throughout the Civil War with the rank of Surgeon-Major. Dr. Potts was also a man of literary parts and at the time of the Sandfield Macdonald Ministry, was editor of the *Toronto Daily Leader*, the organ of the Conservative party in Ontario at that time. Dr. Potts is survived by three sons and two daughters.

Dr. William Winslow Ogden, of Toronto, died April 23rd. Dr. Ogden was born at Port Credit, Peel County, in 1837; he graduated from Victoria College in 1858, and at once went into practice in Toronto where he resided until the time of his death. In spite of physical weakness, for Dr. Ogden was never strong, his indomitable will enabled him to accomplish a great deal in the course of a long and successful career. He continued to practise his profession until four years ago. He was a lecturer on medical jurisprudence and toxicology at the Toronto School of Medicine from 1869 to 1887, when he became professor of forensic medicine at Toronto University. He acted as a trustee on the Toronto School Board for forty-five years; and he took an active interest in politics. Moreover, he was a License Commissioner for some years. He is survived by two daughters.

Dr. William St. J. Downey, of Salt Lake City, Utah, died in April. Dr. Downey was the son of the late Dr. William Stewart Downey, who practised for some time in St. Catharines, Ontario.

Dr. George N. Fish, of Toronto, died May 1st, in the forty-first year of his age. Dr. Fish, who was the son of the late Rev. Charles Fish, was born at Thornhill, Ontario; he graduated in 1898 from Trinity Medical College. In 1900 he went into practice at Brougham, and in 1906 removed to Toronto. Dr. Fish leaves a widow and one child.

Dr. J. G. Layton, of Cleveland, Ontario, died April 15th. Before studying medicine, Dr. Layton was a typesetter at London and later at Cleveland. He took up the study of medicine, graduated, and had worked up a splendid practice when he was taken ill about six years ago.

Dr. Geo. A. Black died in New York on April 15th. Dr. Black, who was forty-five years of age, formerly practised at St. John, New Brunswick; from there he went to Winthrop Highlands, near Boston, where he was in practice at the time of his death.

Dr. Charles Shupe, of Attercliffe Station, Ontario, died May, 6th in the sixty-ninth year of his age. Dr. Shupe was a graduate of Toronto University. He leaves a widow, three sons, and one daughter.

Dr. Thomas Ovens died at Newbury, Ontario, April 24th. Dr. Ovens first went into practice at Arkona; he went from there to Parkhill where he built up a large practice. In 1899 Dr. Ovens did some postgraduate work in England and at New York, and on his return to Canada went into practice at London, Ontario, as a specialist in diseases of the eye, ear, nose, and throat. He leaves two daughters and one son, Dr. Percy Ovens, of Newbury.

Dr. Cameron, of Princetown, British Columbia, died April 22nd, in the seventy-first year of his age.

News

MARITIME PROVINCES

The following candidates have successfully passed the examinations of the medical board of the province of Nova Scotia: Arthur Edward Blackett, Joseph Seaward Brean, Wyman Alexander Cameron, Fred. Thompson Densmore, Philip Michael Gittlesen, Harry Munn Godfrey, Judson Vye Graham, Eliza Kirkpatrick, Melville Krolik, Joseph Emile LeBlanc, Hugh Stewart Moore, Mason Shacknove, Robert Brandon Speer, Ralph Roscoe Withrow, Victor D. Davidson, J. Stanley Chisholm, and Lloyd R. Meech.

The sixty-second annual meeting of the Medical Society of Nova Scotia will be held at Amherst, on July 7th and 8th, next, under the presidency of Dr. C. A. McQueen, of Amherst. Among those who will contribute to the programme are: Dr. John W. Dewis, of Boston; Lieutenant-Colonel J. A. Grant, assistant director of medical services for the Maritime Provinces, and Dr. A. G. Nicholls the recently appointed provincial pathologist for Nova Scotia.

THE New Brunswick Medical Society will meet in Fredericton on the 20th and 21st of July, next, under the presidency of Dr. G. Clowes VanWart.

DR. MCINTOSH, of Andover, New Brunswick, has received the appointment of physician of the Indian Reserve at Indian Point.

ONTARIO

DR. DARIUS A. COON has been appointed medical superintendent of the Kingston General Hospital.

IN his report on the hospitals of the province, Dr. Bruce Smith states that during the twelve months ending September 30th, 1914, 79,857 patients received treatment, the percentage of deaths was 5·93, the provincial grant to hospitals amounted to $278,187, and the total expenditure for hospital maintenance and equipment was $2,579,873. In addition to those treated in the hospitals, 2,092 persons suffering from tuberculosis received treatment in sanatoria. The deaths from tuberculosis amounted to $7\frac{3}{7}$ per cent. of the total number of deaths which occurred in the province.

THE Gore Street church at Hamilton has been converted into a military hospital. The medical officers are Captain D. G. McIlwraith and Captain W. M. Carrick. The hospital has accommodation for fifty patients. It was opened in April and on the 23rd of that month twenty-five patients from the 36th Battalion were admitted.

THE summer home of the Sick Children's Hospital was destroyed by fire on April 23rd. The home, which was situated on Toronto Island, was the gift of Mr. John Ross Robertson. The intention is to rebuild the hospital.

QUEBEC

DURING the year ending December 31st, 1914, 845 patients were admitted to the Alexandra Hospital at Montreal. The total number of cases treated was 870, including 349 cases of diphtheria, 532 cases of scarlet fever, 26 cases of measles, and 49 of erysipelas. Forty-four deaths occurred, the percentage being 5·05.

MANITOBA

During the month of March 487 cases of infectious disease were reported in Winnipeg. Among those were 308 cases of measles, with 5 deaths.

ALBERTA

Dr. Alexander Fisher has been appointed medical superintendent of the Calgary hospitals, to succeed the Rev. D. A. McKillop. Dr. Fisher has been superintendent of the Port Arthur General Hospital. His new duties, which commenced at the beginning of this month, include the direction of five hospitals.

Dr. Alan H. N. Kennedy, of Macleod, has been appointed medical referee for the province under the Workmen's Compensation Act.

Dr. Eager has been appointed medical officer of health of the village of Empress, near Medicine Hat.

SASKATCHEWAN

The hospital at Plenty was burnt down in the recent fire which destroyed the whole of the business section of the town.

Diphtheria has been very prevalent in Regina for some time.

BRITISH COLUMBIA

Dr. James G. R. Stone has been appointed medical officer of health of Anyox and the surrounding district. Dr. William H. Wood, of Port Moody, has been appointed medical health officer of Ioco and district.

The following candidates have successfully passed the examinations of the College of Physicians and Surgeons of the province of British Columbia: A. L. Crease, R. E. Coleman, W. F. Shaw and H. H. Mackenzie.

The physicians of Vancouver have offered to supply a military base hospital of 1,040 beds for overseas service.

MEDICAL COLLEGES

Toronto University

The resignation of Professor I. H. Cameron is announced. Professor Cameron has occupied the Chair of Surgery and Clinical Surgery in the University of Toronto since the year 1887, when he succeeded Dr. W. T. Aikins.

Among the numerous gifts to the University base hospital, which recently left for England, is one from A. C. Hardy, of Brockville, who has given $40,000 towards the maintenance of the hospital during the war. In addition to Mr. Hardy's contribution, subscriptions to the hospital have amounted to almost $50,000. Most of this money was spent on equipment.

Queen's University

The following degrees have been conferred by the medical faculty of Queen's University:

Degree of M.D., C.M.: D. E. Bell, M.B., Kingston, Ontario; J. Carmichael, B.A., Collingwood, Ontario; R. D. Collier, M.B., Picton, Ontario; K. A. Denholm, B.A., Blenheim, Ontario; J. A. Dobbie, B.A., M.B., Ottawa, Ontario; W. V. Edwards, B.A., Souris, Manitoba; R. M. Filson, B.A., Kingston, Ontario; N. M. Halkett, B.A., M.B., Kingston, Ontario; C. B. Kidd, M.B., Ashton, Ontario; L. M. MacDougall, M.A., M.B., Brooklyn, N.Y.; I. R. McKendry, M.B., North Gower, Ontario; P. M. McLachlan, M.B., Lochaber Bay, Que.; R. W. McQuay, M.B., Fox Warren, Manitoba; F. X. O'Connor, M.B., Kingston, Ontario; Smith, M. T., M.B., Carleton Place, Ontario.

Degree of M.B.: G. T. G. Boyce, Georgetown, B.C.; S. E. Burnham, Port Hope, Ontario; S. H. Calnek, Kingston, Jamaica; A. H. Campbell, Welwyn, Saskatchewan; M. F. Coglon, Clarinda, Alberta; T. F. Delaney, Jockvale, Ontario; C. R. Donovan, Brockville, Ontario; J. F. Doyle, Kingston, Ontario; R. H. Fisher, London, Ontario; H. C. Hagyard, Milton, Ontario; G. A. Henry, St. Catharines; Geo. Hooper, Kingston, Ontario; J. S. Kemp, Rochester, N.Y.; D. L. Kennedy, Portsmouth, Ontario; J. H. Leeds, Galt, Ontario; Thos. Little, Kingston, Ontario; D. M. Livingstone, Collingwood, Ontario; S. H. Martin, St. Johns, Newfoundland; D. C. Matheson, Dalhousie Mills, Ontario; L. W. Nixon, Richmond, Ontario; T. V. Plews, Cobourg, Ontario; G. L. Preston, Savannah-La-Mar, Jamaica; H. F. Preston, Kerrobert, Saskatchewan; T. D. Profitt, New Amsterdam, B.C.; W. V. Sargent, Kingston, Ontario; W. R. Stackhouse, Blyth, Ontario; C. B. Waite, Port Hope, Ontario.

Dr. W. G. Anglin, who will accompany No. 5 Stationary Hospital as chief-surgeon, has been granted the military rank of lieutenant-colonel by the Minister of Militia.

DRS. VICTORIA REID, Toronto, T. H. Farrel, Utica, N.Y., and E. C. Watson, Detroit, have been elected to represent the graduates on the Council of the University. These members will serve for a period of six years.

McGill University

THE annual convocation took place on Wednesday, May 12th, on which occasion the degree of M.D., C.M. was conferred upon the following candidates: G. C. Anderson, Central Square, N.Y.; C. A. Arnott, Nelson, B.C.; A. R. Bayne, Bridgetown, Barbados, B.W.I.; W. A. S. Browne, Kingston, Jamaica, B.W.I.; G. C. Burrows, Guelph, Ont.; C. E. Chapin, Philadelphia, N.Y.; H. J. Conroy, Peterborough, Ont.; W. F. Daw, Bay Roberts, Nfld.; J. P. Denny, Georgetown, British Guiana; R. E. Elliott, Rochester, N.Y.; O. E. Farley, Lowell, Mass; E. J. Fitzpatrick, Meriden, Conn.; G. T. Griffith, B.A., Sherbrooke, Que.; G. E. Hodge, Cornwall, Ont.; A. B. Hyndman, Merrickville, Ont.; J. H. Jacobs, B.A.; Caughnawaga, Que.; J. J. Knoll, Daysland, Alberta; F. L. McCarroll, Edmonton, Alberta; J. M. F. Malone, Three Rivers, Que.; A. H. Mann, Ottawa, Ont.; A. J. Martin, Ottawa, Ont.; J. H. Martin, Berlin, Ont.; H. G. Massiah, B.A., St. Lucy, Barbados, B.W.I.; W. J. E. Mingie, Montreal, Que.; H. L. Moffatt, Rialto, Cal.; E. J. Ryan, Bennington, Vermont; S. LeR. Sahler, Kingston, N.Y.; Emerson Smith, Chesterville, Ont.; A. M. J. Tanney, Iroquois, Ont.; J. A. Urquhart, Revelstoke, B.C.; J. H. West, Moncton, N.B.

THE following is the prize list:

Holmes' Gold Medal for highest aggregate in all subjects forming the medical curriculum: W. A. S. Browne, Kingston, Jamaica, B.W.I.

Final Prize for highest aggregate in the fifth year subjects: H. L. Moffatt, Rialto, Cal.

McGill Medical Society Senior Prize: J. A. Urquhart, Revelstoke, B.C.

Honours in aggregate of all subjects: 1, H. L. Moffatt; 2, H. G. Massiah, B.A.; 3, J. A. Urquhart.

Medicine—Honours: 1, H. G. Massiah, B.A.; 2, H. L. Moffatt, 3, F. L. McCarroll; 4, W. A. S. Browne; 5, J. A. Urquhart.

Surgery—Honours: J. A. Urquhart.

Obstetrics—Honours: 1, G. C. Anderson; 2, J. A. Urquhart; 3, G. T. Griffith, B.A.; 4, Emerson Smith; 5, H. L. Moffatt.

Gynæcology—Honours: 1, W. A. S. Browne, 2, H. G. Massiah, B.A. and H. L. Moffatt.

Ophthalmology—Honours: 1, G. C. Anderson; 2, H. G. Massiah, B.A., and J. A. Urquhart.

Oto-Laryngology—Honours: 1, J. A. Urquhart, 2, J. J. Knoll; 3, W. J. E. Mingie and H. L. Moffatt.

Pathology—Honours: 1, Emerson Smith; 2, A. M. J. Tansy; 3, W. J. E. Mingie, H. L. Moffatt and J. A. Urquhart; 6, A. J. Martin; 7, J. H. Martin; 8, H. G. Massiah, B.A.; 9, W. A. S. Browne, R. E. Elliott, G. T. Griffith, B.A.; F. L. McCarroll, and J. M. F. Malone.

Diploma of Public Health: Arthur John Lomas, M.D., C.M., Montreal.

The *ad eundem* degree in medicine was conferred *in absentia* on Lieutenant Elston H. Lawson, R.A.M.C., a graduate of Bishop's College, who is at the front.

The honorary degree of LL.D. was conferred upon Dr. F. J. Shepherd, former dean of the faculty of medicine; Dr. F. P. Walton, former dean of the faculty of law, and Dr. C. Sarolea, the Belgian litterateur.

The convocation closed with the roll call of the McGill men who have fallen on the field of honour, and the name of W. C. Pritchard was added, a medical student who was lost on the *Lusitania*.

DR. T. A. STARKEY, professor of hygiene in the McGill University, has been gazetted Major in the Canadian Expeditionary Forces and has been authorized to organize a sanitary section of the Army Medical Corps. The unit will consist of 27 officers, non-commissioned officers, and men, in command of Major Starkey.

DR. E. M. VON EBERTS has been appointed to administer and dispense the private funds of the McGill General Hospital, which recently left Montreal *en route* for the front. Dr. Von Eberts will receive and forward donations and will transact all the private business connected with the hospital.

Dalhousie University

The following received the degrees of M.D., C.M., at the recent convocation: Eliza Kilpatrick, A. D. Blackett, J. S. Breau, F. T. Densmore, P. M. Littleson, H. M. Godfrey, J. V. Graham, J. G. F. Heal, J. E. LeBlanc, H. S. Moore, and R. R. Withrow.

University medal (Faculty of Medicine) to J. V. Graham.

Prize given by Professor A. W. H. Lindsay for highest marks in second professional examination, D. J. MacKenzie.

Prize given by Professor D. Fraser Harris for excellence in Histology, C. J. Bain.

Manitoba University

The University has offered to provide the personnel of a stationary hospital for service in France. If accepted by the Department of Militia, the personnel of the hospital will comprise nine physicians, seventeen nursing sisters, and eighty-one rank and file.

Alberta University

The senate of the University of Alberta has offered to supply a base hospital of 250 beds for service in England or France. If the offer is accepted, the hospital will be organized by Captain H. H. Moshier, A.M.C., professor of physiology in the University of Alberta.

Western University

It is proposed to erect a new medical building in the near future; the estimated cost is said to be about $100,000.

ARMY MEDICAL SERVICES

It has been suggested that members of the profession who are not in a position to volunteer their services for a period of three years, or for the duration of the war, would be glad to serve for six months. The matter has been brought to the attention of the Minister of Militia and is receiving consideration. Were the period of service shortened, physicians going to the front would be able to resume their private practice on their return without risking its loss.

The provincial government of Ontario has offered to establish and maintain in England a hospital of one thousand beds for the treatment of Canadians. The government is also arranging to send six motor ambulances to France.

Lieutenant-Colonel J. D. Courtney, M.D., of Ottawa, has been appointed by the Minister of Militia as a member of the Canadian medical force at the front. Dr. Courtney is a specialist in diseases of the eye, ear, nose and throat, and will be in charge of such cases among the Canadian troops.

Dr. Reginald de Lotbiniere Harwood, of Edmonton, has been gazetted Lieutenant-Colonel and given command of the 51st Battalion, C. E. F., which is now under canvas at Sarcee Reservation, near Calgary.

Major T. A. Starkey, professor of hygiene in McGill University, has been authorized to organize a sanitary section of the Army Medical Corps. The unit will have charge of the sanitary arrangements along the lines of communication and of the water supply. The equipment will be furnished by the Government.

Recruiting is in progress for Section A of No. 2 field ambulance. A series of ambulance depôts are in course of organization. Section A will be mobilized at Montreal under Captain H. E. Mersereau and will then proceed to Valcartier where it will do regular army medical service work with ambulance drill and training in first aid. The corps will consist of two officers and sixty-two men and, as the need arises, will furnish reinforcements for the ambulance corps now overseas.

Captain R. J. Gardiner, of Kingston, has been appointed director of medical services of No. 6 divisional area, in succession to Lieutenant-Colonel H. R. Duff, who left for the front with the 21st Battalion.

Lieutenant-Colonel F. W. Marlow has been appointed deputy assistant director of the Medical Service, or the administrative head of the medical branch of the second divisional area under Colonel J. T. Fotheringham, with headquarters at the Exhibition Camp, Toronto, in succession to Colonel Roberts who left with No. 4. General Hospital. Lieutenant J. W. S. McCullough has been placed in charge of sanitation in succession to Dr. Amyot, who also has left with the hospital.

Dr. Warnock, M.P. for McLeod, Alberta, is in charge of Imperial remounts at Montreal.

Dr. B. E. Kelly, of Peterborough, has joined the R.A.M.C. and is stationed at Folkestone, England, pending further orders.

The following physicians have joined the Royal Army Medical Corps: Lieutenant Warren A. Dakin, superintendent of the Regina General Hospital; Lieutenants J. J. Field, J. C. Black, J. F. Ellis, and G. M. Gregoire, of Regina; Lieutenants F. H. Wheeler, C. G. Sutherland, and J. H. White, of Moose Jaw; Lieutenant H. A. Stewart of Saskatoon; Lieutenant St. John, of Virden, Manitoba; Lieutenant-Colonel R. M. Simpson, Lieutenants R. Blanchard, Charles H. Hunter, W. J. Good, and O. S. Waugh, of Winnipeg; Lieutenant McMillan, of Tarrys, British Columbia; Lieutenant-Colonel Kidd, of Trenton, Ontario; Lieutenants Chas. W. Vipond and E. Lachapelle, of Montreal.

CASUALTIES

Killed

Major W. P. Dillon, of Ottawa. (No. 2 Canadian General Hospital, Le Tréport, France. Thrown from horse.)

Captain A. C. Bastedo, Bracebridge, Ontario.

Captain George Clarence Gliddon, of Union, Ontario. (10th Battalion).

Reported Killed

Lieutenant W. Fitzpatrick, of Pipestone, Manitoba. (1st Field Ambulance.)

Wounded

Major J. L. Duval, St. John, New Brunswick. (First Field Ambulance.)

Major D. Sutherland, Norwich, Ontario. (First Infantry Brigade).

Major W. W. Nasmith, of Youngstown, near Medicine Hat, Alberta. (46th Regiment.)

Surgeon-Major G. S. Mothersill, Winnipeg. (Tenth Battalion.)

Captain Roy McGibbon, of Sherbrooke, Quebec. (1st Field Ambulance).

Lieutenant F. C. Bell, Winnipeg. (Third Field Ambulance).

Lieutenant W. L. Watt, Winnipeg. (Third Field Ambulance).

Wounded and Prisoner of War at Maintz

Lieutenant W. M. Hart, Regina. (5th Battalion.)

Learning of the imprisonment of Dr. Hart, who has been directing the anti-tuberculosis work in Saskatchewan, the members of the Saskatchewan Medical Association, of which Dr. Hart is a member, passed a resolution of sympathy for his widowed mother and expressed the hope that Dr. Hart would be permitted to return to complete the work so well begun, and, upon the completion of the provincial sanatorium, to take up his duties as medical superintendent there.

A LETTER FROM NO. 1 GENERAL HOSPITAL, C.E.F.

Netheravon, Wiltshire, *April 27th*, 1915.

Dear Sir:—The hospital to which I am attached, No. 1 General, is one of two similar units attached to the Canadian Expeditionary Force, and is commanded by Colonel Murray Maclaren, President of the Canadian Medical Association. Starting out with equipment for 250 patients, this number has been doubled by the War Office, and, like all the Imperial General Hospitals, has now an establishment designed for 1,040 sick or injured men. That even the equipment for the smaller number of patients was obtained on such short notice in Canada reflects great credit on the Permanent Medical Staff of the Militia, and indicates a high grade of energy and efficiency.

Shortly after arriving in camp this unit was ordered to open a tent hospital on Salisbury Plain for the Canadian Contingent. All our stores, consisting of many tons of material, were shipped from Plymouth, and, with the exception of medical comforts which had been freely looted, arrived in good condition, in spite of being dragged through mud and exposed to rain. Tents form good accommodation for healthy men, but when swept by wind, drenched with rain and with the tent floor churned to mud, they do not form an ideal shelter for the sick. It is, however, only fair to state that all the more serious cases were removed promptly to a permanent hospital building at Tidworth.

The rapidly increasing number of sick, due to inclemency of the weather, soon necessitated further and more comfortable quarters, and the Manor House at Bulford, and later the Cavalry School Barracks at Netheravon, were secured. The last named was an admirable site and the buildings were well adapted for the purpose. The original tents were ultimately removed to Bulford, as sufficient accommodation could not be obtained without them. The difficulties of administration were considerably increased by the distance separating the two principal stations, some three and a half miles, as well as by having to look after two convalescent depôts.

During the winter nearly four thousand cases were treated. On the medical side, of which I was in charge, influenza was the most prevalent disease, and although the type of malady was not specially severe, it was often the starting point for bronchitis and broncho-pneumonia. The last-named disorder was unusually prevalent and a considerable number of cases came under observation, many of them being of a severe and even fatal character. In a long hospital experience in Canada I have not seen such virulent cases in young and robust adults. The attack, often preceded by influenzal or catarrhal symptoms, was marked by fever, severe cough, profuse muco-purulent sputa, and in the severe cases cyanosis. Physical examination seldom presented signs other than those of bronchitis; exceptionally, patches of dulness, bronchial breathing and sharp crepitation. After a febrile course of three or four weeks the temperature fell by lysis, but in the severe cases urgent dyspnœa and cyanosis continued, with a good pulse until gradual respiratory failure set in. At the autopsy, section showed profuse purulent bronchitis, with a varying number of areas of consolidation. In some these areas of consolidation were so small as to suggest that the bronchial affection was chiefly responsible for the cyanosis and dyspnœa. In addition to these, some thirty cases of lobar pneumonia with a high mortality (40 per cent.) came under observation.

Acute rheumatism was exceptional, only four well-marked cases coming under this heading. There were, however, numerous cases of lumbago, sciatica, and articular and muscular pains usually regarded as allied to the rheumatic family. The most serious malady in point of severity was meningitis, of which some 45 cases occurred. Although spinal puncture and serum treatments were freely used they did not prove of any great efficacy, and there was a mortality of about 30 per cent.

It is gratifying to record that not more than six cases of typhoid occurred amongst over 30,000 young men. Such a small incidence is remarkable, and may be attributed largely to the typhoid inoculations which were very generally carried out. All the cases were mild but one, unfortunately, developed a myelitis in the upper dorsal region which ultimately proved fatal.

Quite a number of men were admitted for what was termed, for want of an exact knowledge of the condition, functional cardiac disorder. The men were mostly young, under twenty-five or thirty, and complained of dyspnœa and precordial pain on exertion; sometimes palpitation and increased pulse-rate but seldom any irregularity. Blood pressures were normal, and physical signs presented no deviation from the normal, with the exception of one or two cases where some dilation to the right was made out. On actual tests these individuals were found short of breath, whilst the pulse became much accelerated and continued rapid for a considerable time after exertion. Improvement was extremely slow and several had to be discharged from the service.

On the surgical division under Lieutenant-Colonel Cameron a large number of operations for hernia, which had first become apparent after enlistment, were successfully carried out. Another stock operation was one for appendicitis. That surgical technique can be successfully carried out in an improvised operating room was shown by the fact that in only two cases was there any evidence of wound infection. Amongst the minor surgical cases were numerous injuries and fractures resulting from horses and occasionally from football. Foot strain was a very common manifestation of flat-foot, and many men had to be sent home owing to their inability to walk more than a few miles.

The winter's work taken as a whole presented many interesting features, although less variety than in a civil hospital, owing largely to the absence of chronic cases and to the youth of most of the patients. As the great majority of cases able to travel are sent to England from the front, it is probable that this and other similar hospitals will act more as clearing stations on the continent, and that the medical staffs will not have the satisfaction of treating their cases to a conclusion.

F. G. FINLEY.

A SERIES of educational meetings on cancer have been arranged by the Vermont State Medical Society, in coöperation with the American Society for the Control of Cancer. These meetings will take place at Rutland on June 8th, at Burlington on June 9th, at St. Johnsbury on June 10th, and at Montpelier on June 11th. Among the speakers will be Dr. F. C. Wood, director of the cancer research work of Columbia University; Dr. J. M. Wainwright, chairman of the Cancer Commission of the Pennsylvania State Medical Society; Dr. C. F. Dalton, secretary of the Vermont State Board of Health; and Dr. W. S. Bainbridge, of New York.

Canadian Literature

ORIGINAL CONTRIBUTIONS

Dominion Medical Monthly, April, 1915:

Subtentorial tumours and abscesses	C. B. Shuttleworth.

Western Canada Medical Journal, April, 1915:

Diphtheria	A. T. Mathers.

Public Health Journal, May, 1915:

The early diagnosis of cancer . . .	W. H. B. Aikins.
German immigration and the Anglo-Saxon	P. H. Bryce.
Can insurance experience be applied to lengthen life?	A. Hunter.
The recent Australian epidemic of smallpox	W. E. Home.
The social aspects of medicine . .	F. Johnson, Jr.
The relation of preventable sickness to poverty	G. I. H. Lloyd.
Inoculation and typhoid fever . .	H. Morell.
Air and ventilation	Wm. F. Thornley.

The Canada Lancet, May, 1915:

A medical slander case in 1831 . .	Hon. Mr. Justice Riddell.
Renal calculi in women, with report of a pyelolithotomy in an unusual case .	A. C. Hendrick.
The treatment of lobar pneumonia .	J. Rogers.
Understandard lives	J. Ferguson.
The operative treatment of acute glaucoma	G. H. Burnham.

The Canadian Journal of Medicine and Surgery, May, 1915:

Uterine hæmorrhage in the non-pregnant uterus before the menopause . .	A. A. Macdonald.

Canadian Practitioner and Review, May, 1915:

Diffuse septic peritonitis . . .	H. A. Bruce.

Western Medical News, April, 1915:

With the Canadian Expeditionary Force .	H. Morell.
Notes of spinal anæsthesia . . .	H. T. Douglas.
The hæmorrhagic disease	H. Maclean.

Medical Societies

TORONTO ACADEMY OF MEDICINE

THE following are the officers of the Academy of Medicine for the year 1915-1916: president, Dr. W. H. B. Aikins; vice-president, Dr. H. A. Bruce; secretary, Dr. J. H. Elliott; treasurer, Dr. W. A. Young; chairman of the Surgical Section, Dr. J. M. Cotton; chairman of the Medical Section, Dr. W. B. Thistle; chairman of the State Medicine Section, Dr. G. Porter; chairman of the Pædiatric Section, Dr. J. S. Graham; chairman of the Pathological Section, Dr. J. G. Fitzgerald; chairman of the Ophthalmological and Oto-Laryngological Section, Dr. C. Campbell.

The above, with the following, form the Council of the Academy: Dr. G. B. Anderson (past president), Dr. F. A. Cleland, Dr. H. J. Hamilton, Dr. E. E. King, Dr. J. McConnell, Dr. N. A. Powell, Dr. Harley Smith, Dr. C. L. Starr and Dr. D. J. Gibb Wishart.

COUNCIL OF PHYSICIANS AND SURGEONS, NEW BRUNSWICK

The annual meeting of the Council of Physicians and Surgeons of New Brunswick was held at Fredericton on March 31st. Among those present at the meeting were: Dr. T. F. Sprague, of Woodstock, Drs. Thomas Walker, L. M. Curran, W. W. White, A. F. Emery, S. Skinner, of St. John; Dr. J. D. Lewin, of St. Stephen, and Dr. G. C. VanWart, of Fredericton. The following officers were re-elected: president, Dr. W. W. White; treasurer, Dr. A. F. Emery; registrar, Dr. Skinner; auditor, Dr. Walker. The committees appointed were: Registration, Dr. White; Dr. Skinner, examination, Dr. White, Dr. Walker, Dr. VanWart, Dr. Curren; prosecution, Dr. Curren, Dr. White, Dr. Lawson; laws, Dr. VanWart, Dr. Lawson, Dr. Sprague; matriculation examiner, Dr. H. S. Bridges; professional examiners, Dr. G. G. Melvin, Dr. W. E. Rowley, Dr. William Warwick, Dr. John S. Bentley and Dr. T. D. Walker, St. John, and Dr. W. A. Ferguson, Moncton.

LAMBTON COUNTY MEDICAL ASSOCIATION

The regular meeting of the Lambton County Medical Association was held in the Charlotte Eleanor Englehart Hospital, Petrolea, on Wednesday, May 12th. Dr. Edward Fidlar, of the Institute of Public Health, London, read a paper on the "Limitations of laboratory diagnosis." The Association decided to organize a hospital unit and offer it for service in the present war, the unit to consist of two hundred beds, five doctors, five students, ten nurses, a staff of orderlies and stretcher bearers, and equipment. Of the twenty-five men who were present at the meeting, nine volunteered for service, namely, Drs. Morrison, Henderson, Bell, Bradley and McLean, of Sarnia; Drs. Smith and Fairbank, of Petrolea; Dr. Hubbard, of Forest; and Dr. Hicks, of Wilkesport. If accepted, the unit will be organized immediately in readiness to proceed to the front in July.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The eighth regular meeting of the Society was held Friday, January 22nd, 1915, Dr. W. F. Hamilton, President, in the chair.

Pathological Specimens: Series by Dr. L. J. Rhea:

1. Appendix: Patient aged thirty-seven, under care of Dr. Bazin. About three o'clock in the morning he was awakened by pain in the abdomen, referred to the umbilicus. At that time he took castor oil and was relieved somewhat. He got up that morning, but at about 8 o'clock had a second attack of abdominal pain associated with vomiting. During the day he had two or three more attacks but it was not until night that he had an increase in his pulse rate and a temperature, with the pain referred to the right iliac fossa. During the past two or three years he had had pain

in the abdomen from time to time, but nothing very severe. Acute appendicitis was diagnosed and he was operated upon. The specimen shows a very localized inflammatory condition. It is usually thought that an acute inflammation of the appendix is a more or less destructive process involving the whole organ, but one frequently sees that these lesions are quite sharply limited. In this specimen the lesion is localized to the tip and it is sharply marked off from the portion of the appendix distal to it. Lesions like this one are most often associated with a fæcolith but whether he had one that was passed is a question of surmise.

2. Adeno-carcinoma of rectum. Woman, aged fifty-eight, also a patient of Dr. Bazin. For two years she had attacks of diarrhœa, previous to this she was constipated. These attacks occurred at irregular intervals. There was always blood in the stool but never any pain and she always had control of her sphincters. During the last two months the diarrhœa has been quite marked and the amount of blood passed has increased. This woman was very obese and nothing could be definitely made out from palpation of the abdomen. On rectal examination a mass could be felt well up in the rectum, it protruded into the intestine but did not completely surround its lumen. The operation done in this case was a Krasky, the intestine incised well above the mass and the mass removed. There was no evidence of metastasis. The pelvic glands were not enlarged. The only thing pathologically found outside the lesion in the intestine itself was that the mesentery of the rectum was shortened and quite thick. This specimen, that of the rectum, shows that it has been opened opposite the mesenteric attachment. There is a large irregular-shaped cauliflower-like growth which does not completely surround the lumen of the intestine. When one examines it carefully one sees that the mucous membrane in places is reflected for some distance up over the edge of the mass. Examined posteriorly the tissues are thickened and there are small nodules which, when incised, prove to be tumour in the lymphatic node. These lymph nodes contained a gelatinous mucoid material. Another interesting point determined by palpation is that there is a tongue-like process of tumour tissue which passes beneath the mucous membrane to within one centimetre of the upper line of excision. The diagnosis is adeno-carcinoma. The woman is doing well.

DEMONSTRATION: Life history of *Schistosoma japonicum*, by Dr. J. L. Todd.

The specimens shown under these microscopes are interesting in themselves, and also because they illustrate an additional proof of a truth which physicians are coming to realize more and more—that men are, after all, but animals, and are subject to very much the same diseases as those which affect the lower creation. It is for that reason that much light has been, and will continue to be, thrown upon obscure human diseases by an investigation of diseases affecting animals.

Most medical students learn, during a course in systematic biology, that a disease of sheep, called among other names liver fluke, is due to the presence in the liver of a flat worm—a fluke. The life history of that worm is extremely interesting and is mentioned by every lecturer on medical zoology. It furnishes one of the first instances in which two hosts were known to be necessary for the complete development of a parasitic animal. The eggs of the liver fluke reach the outside world with the fæces of an infected sheep. In the presence of moisture the eggs hatch out a developmental form which becomes parasitic in a water-snail. The development of the worm proceeds in the snail and a new form results which attaches itself to blades of grass and becomes encysted there. The encysted form is ingested by browsing sheep. It develops in the body of the sheep into an adult worm, and so the cycle of development of the parasite is completed. The flukes, one division of the flat-worms, are the cause of several interesting diseases in man. The one with which Canadian practitioners are most familiar is that which is commonly called bilharziasis. There are a good many men in Canada who saw service in the South African War and still suffer from cystitis depending upon their infection with *Schistosoma hematobium*, or, as it is usually called, *Bilharzia hematobium*. The precise method by which infection with *Schistosoma hematobium* is contracted is uncertain. Many persons have thought that the eggs, or the free-living embryos were ingested with drinking water. Looss, of Cairo, emphatically maintains that infection is certainly incurred by the penetration of the active, free-living miracidia through the skin of those who come in contact with water contaminated by urine or fæces containing the eggs of the *Schistosoma hematobium*. Neither of these suggestions, however, is entirely acceptable to biologists, who remember the life cycle of the sheep fluke and the way in which it is transmitted from infected to healthy animals. They always have felt that an intermediate host also probably plays a part in the development of the flukes infecting man. The specimens shown to-night demonstrate that an intermediate host, a water snail, does play a part in the development of a fluke parasitic in man.

A disease caused by a fluke, *Schistosoma japonicum,* frequently occurs in Japan and along the west coast of Asia as far south as the Philippines. Rivermen and boatmen are especially liable to suffer from the disease. It is rarely seen among those who do not work in water or in swampy districts. The disease is characterised by an anæmia, by an enlarged spleen, by a cirrhosis of the liver, and indeed, by almost any of the symptoms which might be evidence of a chronic intoxication or of the mechanical disturbance which the presence of worms within the body and organs might bring about. The disease is frequently fatal. It is diagnosed by the finding of the specific eggs in the fæces. In addition to its being quite common among people, the disease also affects cats, and it is quite possible that domestic cats furnish the reservoir from which human beings are frequently infected. The eggs of the worm are passed in the fæces of infected persons. The eggs hatch into free-swimming embryos which penetrate the bodies of a small water-snail; there they develop to form numerous free swimming bodies. These, by experiment, have been shown to have the power of penetrating the skin; having penetrated through the skin they probably find their way by means of the blood passages into the organs where their development into adult worms continues.

Papers: (1) Œsophagoscopy with report of cases, by Dr. Robert Craig.

Discussion: Dr. W. H. Jamieson: I have noted with interest the emphasis Dr. Craig lays on the use of the œsophagoscope. It certainly is a very good aid to diagnosis and also in the surgical treatment of conditions that occur in the œsophagus. Another point of emphasis is the necessity of skill in its use. Of course gentleness is absolutely essential; if we meet with a resistance we must not try to overcome that by using extra strength. In removal of foreign bodies a certain amount of judgement must be reserved, that is, when to stop or to restrain the amount of force in trying to extract. I saw one case, reported by Dr. Armstrong, who did an œsophagotomy, in which, one week previously, the patient had swallowed a couple of gold teeth set on a triangular plate with sharp serrated edges. I could quite easily see the teeth and easily engage them, but on trying to extract them they would not move and the instrument would slip. I therefore decided it was a dangerous method of extraction and the œsophagotomy was resorted to under local anæsthesia with success, the patient making a good recovery. Another case I had where great difficulty was experienced in extracting a cent from a child's throat; it had taken the transverse position and the mucous membrane was much swollen, indurated, and overlapping the edges of the cent. Obstruction to swallowing was quite marked and it was most difficult to get hold of the edge, but I eventually extracted it.

Dr. J. T. Rogers: I wish to congratulate Dr. Craig upon his admirable paper and there are one or two points I would like to emphasize. One is the necessity of previous *x*-ray and physical examinations of the chest. Where the foreign body does not show up in an antero-posterior plate it might be well to take a lateral skiagraph of the chest, as in this way foreign bodies, especially teeth, are much more easily seen. In the case of foreign bodies in the œsophagus, in contrast to those in the larynx, trachea or bronchi, there is usually no haste necessary so that there is plenty of time to have these preliminary examinations made. Ballooning of the œsophagus, which Dr. Craig has mentioned, is certainly of distinct advantage. In pathological conditions of the œsophagus greater skill is required and is necessary in passing the œsophagoscope for the reason that in disease the walls of the œsophagus are friable and brittle and perforation occurs much more readily than under normal conditions.

Dr. F. R. England: I have been much interested in Dr. Craig's paper and it has been my good fortune to see several of his cases. I must say that for precise work the direct visual method, which Dr. Craig advocates and has described so lucidly to-night, is the method of choice. I was present when Dr. Craig removed the pin from the child's œsophagus and was much pleased with his technique and skilful handling of the case. The *x*-ray diagnosis showed the pin in the upper part of the œsophagus. Under ether anæsthesia and the pharynx cocainized, the patient was placed in the dorsal position with the head and neck well extended and drawn over the end of the table. An elongated laryngeal speculum was introduced and the pin promptly brought into view. The shining crockery head of the pin was grasped with forceps and removed. I appreciated the demonstration particularly, for many years ago before we had the advantage of the *x*-ray and œsophagoscopy I had a case where a child had swallowed an open safety pin which lodged in the lower part of the pharynx or beginning of the œsophagus. I could just reach the pin with the finger and succeeded in removing it by grasping it with forceps, opening the pin, and straightening it out on the finger as it was withdrawn. Some damage doubtless was done to the wall but nothing serious and recovery was satisfactory. Regarding foreign bodies which have been swallowed I think we should not be in too great a hurry to operate. Anatomically it is generally considered that a foreign body which is able to pass through the œsophagus into the stomach will also be able to pass out through the pylorus. I have had several cases where children, of four or five years of age, who have swallowed such foreign bodies as a one-cent copper coin, a twenty-five cent piece and in one case a tin whistle equally large in diameter and thicker than the coins, and in every case they were passed "per viam naturales" in the course of a few days. In one case, that of a child of four years, a cent was caught in the œsophagus and I forced it on into the stomach with a probang and it also was passed naturally on the fourth day.

Dr. A. N. Pirie: I would like to ask how the ballooning of the œsophagus is done.

Dr. R. H. Craig: In reply to Dr. England I may say that the coin of the case I reported was in the stomach four days before this patient was successfully operated upon by the general surgeon. I have never passed the œsophagoscope in this country under local anæsthesia; in all these cases I give a general anæsthetic and use the horizontal position for obvious reasons. I present this evening my expanding laryngeal speculum. By using the spine as a fulcrum the larynx can be lifted upward and held in the desired position by a fixed screw which is placed at the side and mouth of the instrument. This instrument can be used to expose the upper third of the œsophagus, as well as for laryngeal examination.

2. Tonsillectomy, by Dr. H. D. Ballon.

Discussion: Dr. R. H. Craig: I wish to congratulate Dr. Ballon upon his comprehensive paper, but I do not consider that tonsillectomy is indicated in every case of enlarged tonsils. I consider the indications for tonsillectomy are: repeated attacks of follicular tonsillitis, recurrent attacks of quinsy, and of course tuberculosis and malignant disease. I would be very loath to have every vestige of lymphatic tissue removed from my children's throats unless there was some specific cause. As to Sluder's method of enucleation it is undoubtedly the ideal one. The main principle of his operation is to lift the tonsil up on the alveolar eminence of the jaw. Bearing this in mind it can be done as well with a Mathieu's guillotine, as with his own instrument. With reference to the treatment of hæmorrhage in these cases it can be readily controlled by placing a piece of absorbent cotton, which has been dipped in an astringent, between the pillars, then clamping the pillars. Early removal of the clamps is advisable in order to prevent sloughing.

Dr. F. R. England: It is not many years ago since a great number of small sclerosed and cystic ovaries were exhibited as pathological specimens at our meetings: we rarely see them now. Adenoids and tonsils are having their day and few children escape. The removal of adenoids and tonsils is not a long or very difficult operation, and it is certainly being very frequently practised, not only by specialists but by general practitioners. I would like to sound a note of warning by urging that the function of the tonsil is not yet well understood and that we should therefore be a little conservative in our treatment of the organ and not too ready to sacrifice it. I have found much benefit from constitutional treatment in many of these cases. The important question is: Is the organ useless and sufficiently diseased to be sacrificed with advantage to the patient?

Dr. W. H. Jamieson: This is rather a large question to decide. In a general way I do not believe of course in removing the tonsils of every child if they happen to be enlarged. If a child is subject to cold in the head that in itself is sufficient cause to remove the adenoid with the tonsils. If the child has enlarged glands in the neck I consider this due to diseased tonsils. As regards their affecting the voice their removal would have no effect whatever; if the tonsils are very large there might be some temporary alteration of the voice. I wish to congratulate Dr. Ballon for his very excellent paper and to express my personal regret that he was so hurried for time that he had to cut down his paper, but I certainly agree in the main with all he has said. As to the Sluder operation I find it a very satisfactory one and in the great majority of cases we can do a complete enucleation by that method. As far as my own opinion goes, because a child has enlarged tonsils it is not necessarily an indication for their removal, but if they are causing symptoms injurious to the child, then, in my opinion, they should be removed.

Dr. E. Hamilton White: I wish to congratulate Dr. Ballon on the interesting paper which he has given us to-night. As to the Sluder method I consider it worthy of all the praise he has bestowed on it. In my experience it has proven highly efficient and satisfactory in quite a varied range of cases. The method of pushing the tonsil through the guillotine with the finger was, I believe, developed and described independently by Mr. Pybus, a general surgeon of Newcastle, England. I was also interested in Dr. Ballon's résumé of the views held at present on the pathology of the tonsil. In 1907 I presented a similar view in connexion with some histological work of my own done at that time. I have been much impressed by the fact that much that was then put forward by various observers in a more or less tentative manner is now definitely accepted as established fact. Certainly our knowledge of the pathology of the tonsils has made great progress in the past ten years and this has come with the development of the various operations for the complete removal of the tonsil, or tonsillectomy. Formerly much confusion arose from the varied results seen after removal of the tonsil. With the older methods a complete removal was often impossible and there was often a corresponding failure to get results. In these days of general enlightenment even the public seem to have realized at last that there is a vast difference between having adenoids and tonsils operated upon and having them removed.

Dr. M. Lauterman: I must admit that my knowledge of pathology has been shaken up a bit. I never thought it was possible that appendicitis could be caused by tonsillar infection and I am free to confess that I am still open to conviction on that point. Neither do I feel that the tonsil can be regarded as the true cause of infection of the cervical glands. I am inclined to think that the nose, teeth, mouth, and the rest of the buccal mucosa may be fully as much to blame as the tonsil; in fact there seems to be a tendency that is very human, to regard things pretty well in the light of the specialty or field that one is working in and thus it is possible to overdo it in some instances, though I confess I feel that when it is absolutely necessary it should be done. The Sluder operation appeals to me very strongly as the operation of choice representing, as it does, a distinct advance and improvement on the older methods.

Dr. J. T. Rogers: The fact that tonsils and adenoids are present is of course no reason that they should be removed, and I think it has been this indiscriminate removal that has caused odium to be cast upon the operation. But if operation is indicated, then enucleation is certainly required. The tonsil is a gland and should be treated as any other gland elsewhere in the body. Because it is situated in the fauces is no reason why it should not be treated according to ordinary surgical principles. Tonsillotomy has not given us the results we expected. It is very humiliating to the laryngologist and discouraging to his patients, to have them return, or what is more likely, to go to someone else, and complain that since their tonsil operation they are just as bad or even worse than they were before. What is done in a tonsillotomy is to shave off more or less of the tonsil and to open up the lacunæ widely and freely, leaving behind an equally or more diseased part of the tonsil. As healing occurs the surface becomes cicatrized over, thus sealing up the lacunæ and in that way forming a perfect incubator for the growth of microörganisms. The question of the removal of the tonsils is very often determined more by their septic condition than their size. When a tonsil has lost most of its lymphoid tissue and is riddled with pus it is no longer a defence but a distinct source of danger to the organism. The protective function of the tonsil is then certainly nil. As to Dr. Ballon's series of eight cases in one family I can corroborate his statements as to the necessity for operation.

Dr. Hamilton: One question I think must be asked in forming an opinion as to whether a case should be referred to a specialist or not in regard to the tonsils is, does the enlargement form an obstruction to respiration? I have noticed defects in the chests of children with enlarged tonsils and I have thought that a great deal of benefit has been derived from the removal of this obstruction; there has been increased capacity of the chest, increase in circulation and the constitutional benefit derived thereby has been marked. Dr. Ballon has presented his subject in a concise, logical, and clear way, and has brought out his points so well that it has given place to this interesting discussion which is of benefit to all.

A WELL-DESERVED honour has been conferred by His Majesty the King upon Dr. Peterson, the principal of McGill University, who has been made Knight Commander of Saint Michael and Saint George. Another name which appears on the list of the King's Birthday honours is that of the Very Reverend D. M. Gordon, vice-chancellor of Queen's University, who has been made a Companion of Saint Michael and Saint George.

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ON THE RELATION OF ANATOMICAL STRUCTURE AND OF ANTAGONISM BETWEEN ORGANS TO DISEASE

By HORST OERTEL

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IT is not my intention to deal here with, or enlarge upon, those subjects which have been so admirably and completely presented by Dr. Adami, Dr. Gurd, Dr. Rhea and Dr. Meakins. Indeed, if I arise to speak at all, it is only to add a few remarks on certain phases in the development and course of disease which have for some time past attracted the attention of pathological anatomists and which have perhaps not received that regard which they deserved in the study of infectious diseases.

There are two points which I should like briefly to bring to your attention: first, the relationship of anatomical structure or architecture of an organ to disease, its development and termination; second, the effect of certain, as yet poorly understood, internal antagonistic actions and relations of organs, which, in a manner now well recognized in embryonic development, may play a part in the history of disease and, for that matter, perhaps in the whole life and death of animal organisms.

Let me, in order to make myself clearly understood, illustrate these points by concrete examples.

We know, for instance, that in pneumonia, quite apart from the virulence of the pneumococcus and the general resistance of the individual, the arrangement of lung tissue has much to do with the origin, development and course of this disease. A person with a marked emphysema, acquired or senile, will react quite differently to this infection to one in whom elasticity and structures of lung tissue have been normally preserved. Not only will the emphysematous

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Opening the discussion on Immunity at the Medico-Chirurgical Society of Montreal, December 4th, 1914.

person be, for anatomical reasons, more liable to contract pneumonia, but the course and outcome of the disease will be largely determined by the changes in architecture of that organ. For a good termination in pneumonia depends materially on an unhindered removal of inflammatory products through the rich network of lymphatics which are normally carried in the inter-alveolar septa and which receive the softened fibrinous exudate largely through the influence of the elastic tissue carried within the walls of the alveoli; on the other hand, bad terminations such as chronicity, abscess, gangrene, even death are apt to follow when the elasticity and those resorbing surfaces which are essential to the removal of inflammatory products have been lost, or greatly reduced by emphysema or by old age.

In other words, quite irrespective of the character of an infection and the ability of the organism to combat it, certain coarser, if you like, anatomical factors are important in determining the origin and history of the disease. I have, for the sake of brevity, chosen this simple and plain example, but others and more complicated ones in practically all organs of the body could be added to illustrate that the architecture of an organ is of prime importance in any disease which may attack it and that we must consider this as well as the more general features of infection and cell reaction.

The second point to which I would like to draw your attention is, perhaps, more difficult to make plain on short notice and in the few words at my disposal to-night. It rests upon certain embryological observations to which pathologists have given little attention in the past, but which deserve, I believe, careful consideration and study in the future.

My own interest was directed to it some time ago while investigating the development of the normal human kidney, and I shall use this as an example, because it illustrates what I propose to bring before you perhaps better than other similar embryological phenomena.

The kidney develops, as is well known, by a series of three more or less distinct organs: pronephros, mesonephros, and finally, metanephros or permanent kidney. The kidney discloses in this manner phylogenetic evolution plainer than other organs. Now it is interesting and instructive to note that, as each succeeding kidney makes its appearance in the embryo, its predecessor degenerates, wastes and is lost. The phenomena leading to this loss are particularly well exhibited by the mesonephros, which presents a much higher stage of evolution than the pronephros, possessing well developed glomeruli and tubules, really being only an abbreviated metanephros or permanent kidney. Even the mesonephros degenerates early in embryonic life with the exception of certain glandular middle parts which enter into the service of the sex glands, where they become, in the female, only accessory parts (paroöphoron, duct of Gärtner and parovarium), in the male, functionating sexual structures (vasa efferentia, coni vasculosi, paradidymis, vas deferens, ejaculatory duct, seminal vesicles). No parts enter into the formation of the permanent kidney.

Now, how is this loss of mesonephros accomplished?

If we investigate this during the various stages of its destruction, we observe changes which are very similar to a severe exudative and productive nephritis. Destruction of Malpighian corpuscles occurs by an engorgement of capillary loops, hæmorrhagic extravasation into capsule, sometimes sufficient to destroy the whole tuft, fusion of capillary loops with adhesions to capsule, and, finally, overgrowth by small round cells which at first form periglomerular infiltrations. At the same time the epithelial cells of the convoluted tubules undergo marked and various forms of parenchymatous degeneration with nuclear kariolysis, desquamation, cast formation and proliferation. Cell infiltration and thickening of the intertubular septa becomes marked and finally the tubules are overgrown by small round cells which later enlarge and assume the characters of distinct spindle cells. In other, notably the posterior, parts of the mesonephros, pure degenerative changes seem to predominate, while later the middle preserved part is gradually drawn by cicatricial tissue to the side of the sex gland into which it is incorporated.

In other words, the loss of the mesonephros, which is a perfectly normal physiological process of development, presents features which are so close to what we observe during post-natal life under pathological conditions in the inflammations of the kidney that we properly term it an acute destructive mesonephritis. Now, that is the remarkable part of it. We have before us a normal inflammation, so to speak, which cannot be traced to bacterial or other foreign toxic action at all; its cause must lie within physiological actions and processes of development; it must be due to agencies within the organism, an auto-intoxication, if that term is here permissible, of the developing embryo.

What are its causes?

It would lead me here too far to go into a detailed discussion of this matter and I refer those who are more especially interested to a full consideration of this question in an article on the physiological degeneration of the mesonephros, published by me in the *Archives of Internal Medicine*, vol. xiii, p. 170, May, 1914.

It must suffice here to state that such phenomena in the embryo (there are many others, as, for instance, the disappearance of the thymus) must be attributed, in all probability, to antagonism of organs. Thus, in the destruction of the mesonephros, we are able to trace it directly to the adjoining sex gland, which ultimately consumes its remains. As the organism presents remarkable examples of altruism with which we are familiar in the action of hormones, so it exhibits and depends for its life, development and maintenance, much like any other state of individuals, upon tissue and organ antagonism, and this force appears, like many others, plainest and accentuated in the developing embryo. These considerations have, to a certain extent, at least, been emphasized by Boll and Roux. But we may go further in view of this close similarity between embryological and pathological processes here described and ask more specifically whether similar phenomena continue after birth? In other words, if, as seems highly probably, antagonism of organic units is one of the moving forces in the life of all individuals, from practically the first division of the ovum to death, may it not enter more than hitherto supposed into production, manifestation and outcome of diseases? Perhaps etiology has, for practical reasons, been too anxious to attach an almost exclusive importance to external causes of disease and has neglected a study of those internal conditions which prepare and make possible the development and specificity and, possibly, also the termination of morbid processes.

How much infections, specificity of diseases and reactions of the organism to infections depend upon infective agents and how much upon the soil and proper balance of the various components of the soil are problems which to-day are not as easily disposed of as was thought in the early days of bacteriological research. The most recent tendency in our ideas is, again, it seems to me, towards a greater rôle of the soil, and this latter has also acquired greater importance in view of the recently revived ideas about the transmutation of bacteria, and their specificity; and in regard to the action on tissues of well-known bacilli, like the tubercle bacillus.

Similar problems and questions arise in the subject under discussion to-night, particularly when we come to the complicated question of treatment by sera or vaccines.

We must, in order to arrive at a satisfactory knowledge and understanding of pathological processes and their intelligent treatment, concentrate all available rays of light upon them and avoid the danger of any one-sided investigation and interpretation of the problems of infection and immunity.

PARENTERAL DIGESTION AND IMMUNITY

By J. George Adami, M.D., F.R.S.

ASKED to introduce this evening's discussion upon immunity, it would, I think, be most serviceable if I placed before you in outline the more recent developments in our views regarding the essential nature of the processes which lead up to the production of the immune state.

All here present will have, I doubt not, a vivid memory of the earlier phases through which we have passed. The first phase was the empirical and lasted up to the recognition of the existence of pathogenic microbes: during this it was admitted that one attack of many infections was followed by resistance to subsequent attacks and there stood out the one solitary application, namely, Jennerian vaccination. The second phase, in the eighties and early nineties, was one of confusion, when, recognizing that the infections were of microbic causation, and being successful in isolating the causative agents, we found that each different pathogenic agent had a distinct *modus operandi*. On the one hand it was found that organisms like the diphtheria bacillus and tetanus bacillus in their growth outside the body produced diffusible toxins, and Behring, Roux and others discovered that the immunity which developed was antitoxic, and on the other hand the majority of pathogenic microbes were found to produce no noticeable ectotoxins, and such immunity as was obtainable was not antitoxic but bactericidal, the fluids of the immunized animal bringing about the solution and death of the causative bacteria.

Rapidly following upon this came the discovery in France and Germany by Bordet and Pfeiffer, respectively, that the latter form of immunity demanded the presence of two orders of substances in the body fluids of the immunized animal. How great was the confusion is indicated by the fact that for one of these, Pfeiffer's "immune body" and Bordet's "*substance sensibilatrice*", the other names of "amboceptor", "*fixateur*", "intermediate body", "sensitizer", "preparator", "desmon", "copula", were proposed by various workers. Nor was the confusion lessened by the continuing fight between the German *humoralists* who were satisfied to study the phenomena manifested by the body fluids alone, and the Franco-Russian *cellularists*, led by Metchnikoff, who, with broader histological insight, laid stress upon the cellular reactions to infection.

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* Contributed to the discussion upon recent advances in the theory and practice of Immunity, held at a meeting of the Montreal Medico-Chirurgical Society, December 4th, 1914.

The third phase was that of the ascendency of Ehrlich's "side-chain theory" of immunity. It was found that antibodies present in the blood serum neutralised the toxins; all the indications were that chemical interaction went on between the two, but toxins were active in such extraordinary minute quantities, and also were produced in such minute quantities that chemical methods of analysis revealed nothing beyond the probability that they were to be regarded as protein degradation products. The biological test was far more delicate than the chemical. We were, in fact, beyond the realms of chemical technique. If confusion were not to be worse confounded, it was necessary to have some working plan whereby to visualize the processes that went on in the reaction between the microörganism and its products, and the organism. This Ehrlich afforded in his celebrated side-chain theory. Some may to-day criticize that theory, and may gird at its toxins, toxoids and toxones, its haptophores of the first, second and third orders, its end-piece and mid-piece of the complement, but unquestionably it afforded a working scheme, whereby a common basis for expression of phenomena was afforded, and equally unquestionably it promoted an enormous burst of activity in the study of immunity problems. What is more, although Ehrlich cautiously refrained from suggesting or promising any particular element in the cell as being provided with side-chains, his theory was based upon the only rational conception of cell metabolism—that which regards the molecule of living matter as of extraordinary complexity, and in a state of constant unsatisfaction, built up by linking on other simple molecules, and as constantly, in the performance of function, giving up or discharging into the surrounding medium these and other molecular complexes which it has elaborated.

In my "Principles of Pathology" published in 1908, I called attention to certain defects in Ehrlich's theory, and pointed out how it might be brought into fuller conformity with actual knowledge of general cell activities and of enzyme action. I laid down that throughout the whole study of immunity we deal with "the methods by which living matter, whether animal or vegetable, reacts towards other living matter, whether animal or vegetable, and the products of the same which come in contact with it, and although," I continued, "the statement may at first encounter appear to be both novel and extreme, further thought will confirm it; the problems of immunity narrow themselves down to special problems bearing upon the assimilation and digestion of unusual proteid matter." I might have added, for my treatment of the subject was consistently along these lines, that they resolve themselves into studies of enzyme action.

Long years ago, in the early eighties, I remember Sir Michael Foster teaching us that the assimilation of foodstuffs evidently demanded that more complex molecules of foodstuffs were not built into the cell direct, but were first broken down into their simpler constituent molecules, and of these the molecules common to the constitution of the foreign foodstuffs and to the cells are taken up by the latter, and used for building-up purposes. This view to-day is universally accepted, more particularly as the result of Emil Fischer's studies upon the chemical constitution of proteins, and demonstration that these are complexes formed by the union of varying proportions of mono- and diamino-acids. The Germans speak of this as the 'Baustein,' or building-stone theory. It is a familiar fact that proteids taken as food, while they disappear from the intestinal contents, are not to be detected in the blood and lymph coming from the intestinal tract. And this is true not only of the fully-formed proteins, but also of the peptones and proteoses of the alimentary canal resulting from the disintegration of the larger protein molecules into simpler soluble proteins of the second order. Indeed we have this remarkable fact that if, instead of allowing them to be absorbed and acted upon by the intestinal mucosa, we introduce these peptones and proteoses directly into the circulation, they are found to be highly toxic. There is evidently, therefore, a pronounced difference between *enteral* or intestinal, and *parenteral* digestion, the breaking down, that is, of foreign proteins introduced into the organisms outside of, and without the intermediation of, the digestive tube.

We owe to Victor Vaughan, of Ann Arbor, and his long continued studies from 1901 onwards, the demonstration of the fact that outside the body, by the simple procedure of digestion with several times its bulk of absolute alcohol in the presence of 2 per cent. of sodium hydroxide, any protein, even so apparently harmless a body as egg albumen—is split up into a poisonous and a nonpoisonous moiety, the former soluble in alcohol, the latter insoluble, and this poisonous moiety, when introduced into the system other than through the intestine, is rapidly fatal in doses so minute as from 8 to 100 mg. per guinea-pig. Evidently in the process of passage through the intestinal mucosa, either this poisonous moiety of the protein molecule is detoxicated, or protein disintegration there is so carried on that it is never given off.

The high significance of these observations lies in this, that the bacterial bodies are largely compounded of proteins, that bacterial bodies similarly treated give these same poisonous and non-poisonous moieties: that the process of destruction of bacteria that have gained entrance into the tissues is one of parenteral digestion, and that the phenomena associated with parenteral digestion must therefore be closely studied in order to understand the nature of infection and the phenomena of immunity. It is this study that has ushered in the latest phase of our subject; and in this subject two names stand out particularly, those of Victor Vaughan and Abderhalden. Perhaps it would be equally correct to state that this latest phase corresponds with the study of anaphylactic phenomena, and of their relationship to immunity, for as I shall proceed to show, the two are most intimately connected.

If I may judge from the answers received this autumn from the candidates for Dominion Medical Registration, anaphylaxis is evidently regarded by the majority as one of those subjects that no fellow can be expected to understand; and addressing a general medical audience it is essential to describe its broad phenomena. Briefly, then, whereas, as everybody knows, the introduction of foreign proteins into the economy is in general followed by the development of immunity, the system gaining the power of rendering harmless many times the fatal dose of that protein, it is found that, employing minute doses of the protein for the first injection, if now, at the end of a week or ten days a second dose be injected, larger than the first, but still many times less than that producing serious symptoms on first injection, then instead of showing evidences of immunity, on the contrary the animal has become hypersensitive. It may, indeed, die within three to five minutes. In the guinea pig, which shows most strikingly these phenomena, there is an intense contraction of the muscular walls of the bronchi, whereby dyspnœa is brought about, with overfilling of the lungs so extreme that even when the chest wall is freely cut open immediately after death, the lungs remain expanded. With this there are muscular cramps and obstruction to the onflow of blood with capillary congestion leading to scattered hæmorrhages. This state can be induced by inoculation of any foreign protein, even one ordinarily so harmless as egg albumen, or, on the other hand, by the employment of pathogenic bacteria and their proteid products.

Now here is the significant point. The symptoms and lesions produced by the poisonous moiety of split protein are, as Vaughan was the first to point out, identical with those seen in anaphylaxis. In other words anaphylaxis is due to the sudden setting free in the economy of the poisonous bodies of the same nature as the poisonous disintegration moiety of proteins. On the doctrine, therefore, that like results are produced by like substances, we arrive at the conclusion that this hypersensitiveness or anaphylaxis is essentially due to a disintegration of the introduced proteins with rapid liberation of the poisonous moiety.

But the first dose introduced sets up none of these phenomena, the second does. It is obvious that following upon the introduction of the foreign protein, the organism has gained a new power, that of splitting up the foreign protein.

It is at this point that Abderhalden's observations acquire a high significance. In 1910 Abderhalden with various pupils published a remarkable series of "serological studies by means of the optical method." Starting from the fact that the different proteins and peptones present each in the polariscope a specific index of rotation, he demonstrated first that, as determined by the polariscope, the ingestion through the alimentary tract of any particular protein has absolutely no effect upon the blood serum; its rotatory power is unaltered from the normal. But inject any of the more common proteins subcutaneously or directly into the blood, and in twenty-four or forty-eight hours remove some of the blood, separate the plasma, add to this a little of the protein, and now a remarkable change is seen: the index of rotation of the plasma undergoes progressive alteration, a clear indication that the protein is being broken down, and this is confirmed by the fact that by dialysis peptones can be separated off. In other words, within forty-eight hours after the introduction of a foreign protein, the system has responded either by elaborating a proteolytic or proteoclastic enzyme, or, it may be, by the rapid increase of production and discharge of already existing proteoclastic enzyme present in certain cells. What I would especially emphasize is the fact that the enzyme thus first liberated is not specific. It is an indifferent proteoclastic ferment: it will act not only on the particular protein inoculated, but on other proteins: it will break down indifferently globulin, casein, edestin, gelatin and their peptones, with the evolution of toxic peptone-like bodies.

It might be laid down that this indifferent ferment first produced is the cause of the anaphylactic phenomena. Against this view is the fact that Abderhalden's ferment is recognizable in twenty-four to forty-eight hours, whereas anaphylactic phenomena are not obtainable until the sixth to the tenth day. This in itself is not absolute disproof, for one of the factors governing the rate of enzyme action is the amount of enzyme present, and this might well depend upon the accumulation of a sufficient amount of the enzyme. The amounts should be large to cause dissociation of the foreign proteid at such a rate and such an extent as will lead to the production of symptoms.

There are, however, serious objections to this view. As pointed out by Abderhalden the anaphylactic phenomena are specific; it is only the protein first introduced that sets up disturbance; on subsequent injection other proteins are not affected, whereas Abderhalden's proteolytic and peptolytic enzymes are active in respect to any protein. The only safe conclusion is, therefore, that in these data we have evidence of the development of two stages:

1. Elaboration and discharge into the blood plasma, within forty-eight hours, of *indifferent* proteoclastic and peptolytic enzymes, affording Abderhalden's phenomenon.

2. The gradual production of more highly developed *specific* proteoclastic enzymes, having the power of rapid dissociation of the particular protein introduced, with liberation in the course of a few minutes of sufficient toxic disintegration product or products to set up symptoms.

I should note in passing that it cannot be regarded as absolutely settled as yet whether it is the enzymes liberated into the blood plasma that are the essential cause of the anaphylactic symptoms, or whether the phenomena are due to intracellular dissociation in specific groups of cells, such as certain cell groups and centres in the nervous system. If these cells under the action of the first dose have been stimulated to produce and consequently store the non-specific enzyme, the moment the foreign protein comes into contact with their cytoplasm, or is absorbed by them, it will undergo degradation. An extraordinarily minute dose of foreign protein in this way, by acting on, or being acted on by specific cells might set up fatal results. The rapidity with which anaphylactic phenomena may show themselves, and that upon the introduction of extraordinarily small amounts of any particular protein, rather favours the latter view: it suggests that there is a selective taking up of the protein by particular cells.

What I want to bring specially before you is that the two stages above postulated lead up to a third; in other words, that anaphylactic phenomena afford us explanation of the nature of immunity. By cautious reinjection of the foreign disharmonious protein we can pass through the anaphylactic to the succeeding stage of immunity. Now the characteristic of a true bacterial (as distinct from an antitoxic) immunity is that the body fluids gain remarkable digestive or fermentative powers. Any one who has observed Pfeiffer's phenomenon—has seen living typhoid or cholera organisms swell up and dissolve like pieces of sugar in the serum of a highly immunized rabbit or guinea pig—cannot fail to be impressed by the extraordinary digestive powers that have been acquired by the body fluids, through this process of immunization.

Everything here indicates that we deal with proteoclastic enzymes. Only now, in the immune animal, the process no longer leads to acute poisoning. I admit that more than one explanation may be sought and given for this fact, but choosing the simplest, we see here a further evolution of the same process, namely the development by the organism of further enzymes which disintegrate the poisonous moiety, and so carry on the degradation of the foreign protein to a further and harmless stage. It is pleasant to think that we owe to one of our own workers, Dr. Fraser B. Gurd, the first experimental evidence of the co-existence of these two orders of enzymes (lysins) in the immune animal*. As Dr. Gurd will show in his communication, it is not that the earlier enzymes are completely replaced: they are still active and indeed abundant, and evidence of the presence of these sensitizing bodies can be obtained in immune animals. But after they have broken down the specific protein with the production of the poisonous substance this is immediately acted on by the new enzyme and rendered innocuous.

To me it is not a little curious that Abderhalden, Thiele, and Embleton, and the other workers in this territory, while familiar with the existence of the great numbers of individual enzymes that are to be isolated from the organism, have not taken up and considered this probability of, or recognized the indications pointing to, the production of a succession of progressively more specific and more active enzymes in the development of the immune state.

Time forbids that I should deal with the nature of enzymes and the theory of their development. There is one point which before closing I must take up, namely, the nature of ectotoxins.

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* *Amer. Jour. Trop. Dis. and Preven. Med.*, I, 1914, 776; *Jour. Med. Res.*, XXXI, 1914, 205.

In the first full study of these ectotoxins, that, namely, by Roux and Yerson a quarter of a century ago upon the diphtheria ectotoxins, it was clearly pointed out how many properties these bodies possess in common with the group of organic enzymes: their activity in extraordinarily minute doses; the impossibility of isolating them in a pure state; their destruction by a temperature of 60° Centigrade; their precipitation by phosphates and other salts. It is not a little interesting how notwithstanding bacteriologists in general have shown unwillingness to accept this view. Long years ago Sidney Martin in London brought forward further evidence to the same effect, that the diphtheritic membrane was not in itself highly toxic, that it contained an enzyme whose activity gave origin to toxic albuminoses, and that the internal organs, while showing no evidence of the toxin proper, might come to contain these toxic bodies. The significance of these observations lies in the fact that, as everybody knows, diphtheria bacilli are present in quantity in the membrane, and are almost absent from the internal organs. I have not come across a single leading German work on bacteriology that has taken any serious notice of these observations of one of the most brilliant and capable English workers. The stumbling block has evidently been in the prominence obtained by the phenomena of antitoxin production. This reactive production through the agency of ectotoxins of bodies which combine with the ectotoxins to render them inert, is wholly outside our usual conception of enzyme activities, and yet it deserves pointing out that, if we take solutions containing what we recognize as enzymes foreign to the animal body, enzymes, for instance, obtained from plants, and if we inoculate these into the animal body, anti-enzymes are developed identical in all their properties to the antitoxins. Dr. Zinsser of Columbia University in his excellent work upon "Infection and Resistance" which has just been published in the last few days, lays down that there is an important difference between ectotoxins and enzymes in their mode of action. He states: "while the toxins are apparently bound or neutralized by the tissues they attack, the action of an enzyme seems rather to be a process in which the enzyme unites with the substance it acts upon, is released as this result is obtained, and freed for further action without noticeable loss of quantity."

Here there is this very confusion that I have already noted, that, namely, of dwelling only upon the combination of toxin and antitoxin in the one case, and of the action of the enzyme upon the substrate in the other. Only two paragraphs lower down Zinsser calls attention to the incubation period in the action of toxins, pointing out that this is longer when small doses are given, shorter when large doses are administered, but always evident. Thus in the horse he points out that it may be four or five days before the action of tetanotoxin shows itself: in mice, as De Waele points out, animals extremely susceptible to tetanotoxin, a minimal lethal dose gives an incubation period of thirty-six hours; if 3600 lethal doses be administered this is shortened to twelve hours, and whatever the dose, the interval cannot be shortened below eight or nine hours. Such facts as these cannot be explained as due to the activity of an ordinary mineral or alkaloid poison: ordinary poisons have no incubation period. It is wholly consistent with the action of a proteoclastic enzyme which, present in the blood or becoming absorbed by certain cells, by acting upon some specific proteid substrate, splits off a toxic moiety which, accumulating under the continued action of the enzyme, at length is present in sufficient amount to set up symptoms. The full proof of the enzyme nature of ectotoxins has recently been afforded by Abderhalden, who has demonstrated *in vitro* the proteoclastic properties of these bacterial toxins. In fact we must conclude that just as the animal body gives off free enzymes along the course of the alimentary canal, whereby foreign proteins of the foodstuffs are split up, and so made capable of absorption, so certain bacteria have a like power of discharging enzymes which can act upon the proteins of the animal economy and prepare them to be assimilated by the bacterial body, and it is in this process of disintegration of the proteins of the organism that the toxic moiety is liberated, thus inducing the symptoms of disease. It is these, and not the so-called ectotoxins, which are the immediate causative factor of this morbid phenomena.

Thus, to conclude, I would lay down the following as summing up the views here put forward as most satisfactorily harmonizing the data at present in our possession.

1. Whatever the nature of enzymes, the organism has the power of elaborating new orders of these bodies in and from its cells in response to the entrance into the tissues of foreign proteins, and potential food-stuffs in general.

2. The development of anti-bacterial immunity in an animal is essentially the development of the power of parenteral digestion of the constituents (mainly protein) of the pathogenic microorganisms by the tissues.

3. This is rendered possible by the elaboration of a succession of (mainly) proteoclastic enzymes.

4. Three stages are to be recognized in this process:

(*a*) The development of indifferent proteoclastic enzymes.

(*b*) The development of specific proteoclastic enzymes, splitting the bacterial proteins into highly poisonous and non-poisonous moieties.

(*c*) The development of toxoclastic enzymes which render the disintegration products innocuous.

5. Ectotoxins are to the microörganism what discharged enzymes are to the animal. They have all the properties of enzymes.

6. They are not themselves toxic, but proteoclastic, and it is the products of their activity upon the proteins of the organism that are the essential toxic substances.

7. Antitoxic immunity is thus wholly distinct from antibacterial immunity. It is a process not primarily of digestion and disintegration, but rather of combination and fixation of enzyme, so that this is no longer capable of attacking and disintegrating successive complex proteid molecules, or, perhaps, of development of toxoclastic enzymes by the tissues, which disintegrate the toxic proteins as they are produced, rendering them innocuous or both.

The Canadian Dental Corps in process of organization will be in command of Lieutenant-Colonel J. A. Armstrong of Ottawa. With him will be associated Major Gibson of Ottawa and Major A. A. Smith of Cornwall, together with twenty-four captains and twenty-four lieutenants. Several dental surgeons, who already have left for the front, will be attached to the unit when it arrives in England.

THE PHENOMENA OF ANAPHYLAXIS AND ALLERGY AND THEIR RELATIONSHIP TO IMMUNITY

By Fraser B. Gurd, B.A., M.D.

Montreal

THE discovery of the phenomena of anaphylaxis and allergy in 1906 has had such a vital influence upon the science of immunology that a proper conception of their nature is essential, if we are to be able to follow the recent and future advances in the knowledge of immunity processes.

In this short paper I shall attempt briefly to review the established characteristics of the two phenomena and indicate their relationship to one another and to immunity processes in general. In doing so I will adopt a frankly didactic rather than an argumentative or discursive attitude, in order that as clear a conception of the importance of these reactions may be obtained, as possible.

Should it prove desirable, the arguments supporting and opposing the views outlined can be considered in the discussion which is to follow.

By the term anaphylaxis (Richet) is designated the constitutional phenomena accompanying protein hypersensitiveness, while by allergy (von Pirquet) is meant the local or focal altered reactions which take place upon reintroduction of protein materials into sensitive individuals.

The experiments which are detailed in the following paragraphs exemplify certain of the more striking characteristics of the anaphylactic reaction.

If a series of half-grown guinea pigs each receive a dose of 0·2 cubic centimetres of sheep serum and subsequently be subjected to the following treatments certain striking and interesting results may be demonstrated.

G.P.A. may be given within five days of the first injection from 0·2 to 2·0 cubic centimetres of sheep serum without manifesting untoward symptoms.

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G.P.B. fourteen days after the preliminary injection receives an intravenous injection of 0·5 cubic centimetres of sheep serum. Within a period of one or two minutes the animal will show evidences of grave irritation and will die within from three to eight minutes.

These manifestations consist of evidences of pruritis—scratching and sneezing; dyspnœa,—cough, cyanosis, slowed and forced expiratory effort with gradual cessation of respiration; nervous irritation,—convulsions and coma. Upon examination may be found drop in temperature, drop in blood pressure and leucopenia.

Immediate autopsy reveals the fact that the heart is still beating, the lungs are distended and present numerous hæmorrhagic areas, there may be marked splanchnic congestion.

The above may be looked upon as the typical anaphylactic experiment in the guinea pig and is known as anaphylactic shock.

G.P.C. is injected upon the same day as G.P.B. with an intraperitoneal dose of 0·2 cubic centimetres of sheep serum. There will be no immediate onset of symptoms, but within a period of one half to one hour the animal will be found to be suffering from malaise; the hair will stand on end and the pig will huddle itself in a corner and may shiver and be obviously unhappy.

The temperature will at first drop slightly and then show an elevation above the normal; a transient leucopenia occurs followed by leucocytosis. A scant purulent exudate may be recovered from the peritoneal cavity. The animal will recover within 24 hours.

We have thus discovered that if an animal which is susceptible to anaphylactic shock be given a *small* dose of protein a simple febrile reaction occurs.

Upon the following day G.P.C. is injected in a manner and with an amount of serum similar to G.P.B. No evidences of intoxication are found. This and other experiments prove that this animal has been desensitized; while in this state the animal is said to be refractory.

G.P.D. receives upon the fourth day after the original injection of 0·2 cubic centimetres an intraperitoneal injection of 2·0 cubic centimetres of sheep serum, and thereafter a like amount on three or more successive occasions at intervals of five or six days.

After a lapse of from twelve to sixty days after the last injection a dose similar to that introduced into G.P.B. is injected intravenously. No reaction takes place. If, however, a large dose, 3·0 cubic centimetres of sheep serum, be injected, typical anaphylactic shock with death will supervene.

This experiment demonstrates that an animal which receives repeated doses of protein remains hypersensitive to this protein, but that large toxic injections must be employed in order to bring about anaphylactic shock.

Another pig, G.P.C., fourteen days after the sensitizing injection of 0·2 cubic centimetres of sheep serum, is bled to death and its serum recovered. The serum thus obtained is injected into a normal pig with the result that the latter becomes highly hypersensitive. In order that such a transference of the anaphylactic state may be brought about, it is necessary to inject from two thirds to the total amount of serum recovered.

Similarly, if the serum of an animal treated in the manner of G.P.D. be injected into a normal pig, the latter becomes passively hypersensitive. It is found, moreover, that but a very small amount of serum, e.g., 0·1 cubic centimetre, is necessary.

The paradoxical phenomena are thus noted, that the serum of an animal, whose hypersensitiveness is easily demonstrated, contains but a small number of units of the anaphylactic body, whereas the serum of an animal in whom hypersensitiveness is proven only by the employment of large toxic doses of protein, contains a very large number, 100 to 200, or more, of units.

Obviously the animal D is not desensitized as was C, but has developed a state which may be described as immunity to the protein. At the same time it is noticed that *the more highly immune an animal may be, the greater is its potential hypersensitiveness.*

How, then, can the relationship of these two conditions of hypersensitiveness and immunity be explained? First, let us note that it is possible to transfer passive immunity to a normal animal by the employment of large doses, 2·0 cubic centimeters, of the serum from the repeatedly injected animal and also to confer immunity upon an actively sensitized animal such as G.P.B.

The sequence of changes which occurs in the animal's tissues is believed by the author to be somewhat as follows. Complex proteins, such as serum albumin, are not toxic to the tissue cells; they are, however, foreign and useless. The body, therefore, produces an antibody which acts upon the protein in such a way that a toxic substance (split-product) is formed. The animal whose tissues contain this antibody is then hypersensitive to such a protein. Reinjection of the protein in sublethal doses stimulates not only an increased production of the anaphylactic antibody but also a second order of antibodies which are able to neutralize or detoxicate the toxic product arising from the action of the first or anaphylactic antibody upon the protein.

The work of Vaughan, Abderhalden and others upon parenteral digestion makes it appear as if many, if not all, the phenomena of immunity may yet be explained in this way. If we attempt to bring the reactions of anaphylaxis into line in this fashion we have but to consider the anaphylactic body as being in the nature of a peptic ferment, and the second order, or immunizing body, as an ereptic ferment.

The peptic ferment reduces the protein to peptones and proteoses which are toxic, while the ereptic ferment causes cleavage of these substances, with the production of harmless or even utilizable peptids and amino-acids.

ALLERGY

When a normal individual is inoculated with smallpox virus a period of three days intervenes before an inflammatory reaction occurs. Once commenced this progresses for another week until an acute pustule is formed. If, however, the individual has been previously vaccinated, within a period of two years, the tissues react in a different fashion, hence, allos-altered, ergos-reaction, allergy.

In this altered reaction the hyperæmic stage is reached after the lapse of but a few hours, nor does it progress to a stage of pustulation, but is of short duration and does not go beyond the stage of hyperæmia with slight œdema.

The essential feature of this reaction is in the shortening of the incubation period. If the cells and vessels react soon after the introduction of the virus a less pronounced reaction will suffice to destroy the invader, since but little proliferation of the latter will have had time to take place.

This curtailing, or elimination, of the incubation period may be explained as follows: Morphologic tissue reactions—that is, vascular dilatation and cellular activity—occur only when the tissues are irritated. This may be demonstrated by the simple experiment of burying in the tissues two pieces of catgut one of which has been dipped in turpentine. At the site of the plain gut no reaction is noted, whereas an abscess forms about the turpentine-soaked gut. The vaccinia virus is essentially nontoxic and hence does not irritate the tissues. No reaction, therefore, occurs until such time as there has been produced in the tissues a body capable of so acting upon the virus that a toxic product is liberated. So soon as this toxic substance is developed the morphologic reaction commences, the degree of reaction depending upon the number of units of virus which have been acted upon.

If it be borne in mind that of the two offensive methods at the disposal of the body whereby infection is overcome, cellular phagocytosis is much the more potent, granted that it may be induced to take place, the importance of the hypersensitive stage in stimulating the allergic reaction is manifest. *Under normal conditions protection of the individual against infection depends upon hypersensitiveness to the bacterial protein.*

The employment of bacterio-proteins or vaccines in prophylaxis or cure of disease is to be dealt with in other papers. Permit me, however, to indicate the problems which confront us in our efforts in that direction based upon our knowledge of anaphylaxis and allergy.

By means of the injection of bacterio-proteins or vaccines various results may be obtained, depending upon (1) the state of the individual injected; (2) the dose of bacterio-protein injected and (3) the interval allowed between injections. Thus any one of the following four alterations in the hypersensitiveness may occur.

1. Hypersensitiveness may be induced if such be absent, or increased if already present.
2. Hypersensitive individuals may be desensitized.
3. Both hypersensitiveness and immunity may be developed by means of repeated injections.
4. In chronically infected individuals where immunity suffices to mask their hypersensitiveness the immunizing bodies may be depressed so that their hypersensitiveness becomes more apparent and allergic reactions are stimulated.
5. Both sensitizing and immunizing bodies may be depressed to such a degree that all cellular and vascular reactions cease.

It is thus seen that in the employment of vaccines or bactero-proteins for clinical purposes we are, to say the least, dealing with a two-edged sword. In order, therefore, that favourable results may follow such inoculation procedures it is necessary that the physician know, relatively at least, the degree of sensitiveness of the individual to be treated and have a clear conception of the alterations, in the tissue and serum reactions, which he wishes to stimulate.

PROPHYLACTIC USE OF BACTERIAL VACCINES

By Lawrence J. Rhea, M.D.

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THE use of what is known to-day as bacterial vaccine has come not from empirical reasons but from the application of scientific principles that have largely taken the place of empiricisms in medicine; from the practical application, both prophylactic and therapeutic, of scientific reasoning.

In discussing the prophylactic use of bacterial vaccines I shall refer to them in their broadest sense, regardless of their manner of preparation, save in the case of antityphoid vaccine, which to-day is so much before the medical profession as well as the general public.

Bacterial vaccines may be considered from two points of view, a technical and a therapeutic one. The technical procedures in their preparation are but means to an end; the production of a material that in its practical therapeutic application gives good clinical results. These technical procedures have been changed and improved from time to time, but, as they are of chief interest to the pathologist, I shall not go into their details. They all have been made with the view of producing a material whose therapeutic value is increased.

It is generally accepted that antigenic or protective properties of a bacterial vaccine are most efficient when the organisms which they contain are as nearly as possible in a living condition. The protective reaction in the body of an individual inoculated with such a vaccine should more nearly approach the protective reaction resulting from an infection with a virulent organism of the same kind.

What is attempted, then, is the production of a material which at the time of its therapeutic application will fulfil at least four conditions:

First, it must not contain any constituent or constituents which

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in properly regulated doses will produce detrimental lesions either at the point where it is inoculated or anywhere else in the body.

Second, it must not contain bacteria in such a state of viability as to make possible in any way their multiplication in the body and lead to an infection in the individual inoculated, or produce in them a state of bacterial carriers.

Third, the organisms should be in such a state that, should they accidentally come in contact with proper foodstuff, they will not multiply and thereby endanger the health of the community.

Fourth, they must contain certain constituents the reaction to which on the part of the individual inoculated will produce a body or bodies that will be antagonistic to the development of the same kind of organism in the body; that is, they must be efficient in terms of protective reaction on the part of the body.

The ideal bacterial vaccine, then, would be such a one as produces on the part of the body a reaction in every way similar to the virulent type of the organism from which it is prepared, save that there are no immediate and remote detrimental effects upon the body. The organisms in such a vaccine would have all the potential properties of their virulent brother save that they have lost their sting.

The prophylactic use of bacterial vaccines has been employed against a number of diseases of both man and the lower animals. The disease in man in which they have been used on the largest scale is typhoid fever. The beneficial results that have been obtained from antityphoid inoculation are familiar to you all, and I shall not refer to the convincing statistics upon the subject.

The recent work upon this particular prophylactic vaccine has dealt particularly with three points: first, the technical procedures in its preparation; second, the strain or strains of organisms to be employed; third, the number, size and interval of the dose to be given.

The technical procedure in the preparation of antityphoid vaccine has developed along three lines: first, the use of heat as a means of killing the organisms; second, the use of some substance by means of which they are sensitized; third, the use of some chemical substance or substances in killing them. In referring to these three points I shall not go into the details connected with each of them but shall discuss briefly some of the chief principles which underlie their application and some of their advantages and disadvantages.

The use of heat, within certain fairly limited degrees, produces a vaccine the efficiency of which, in terms of protection to the individual inoculated, is well recognized. The temperature and the time it is applied has constantly decreased from above 60°C. for two hours to a temperature slightly above 50°C., for a period within an hour. The limits of 6° to 8° may make no great difference when applied for a few minutes but, when applied for an hour or more, lead to changes somewhat in proportion to the time it is applied. It is well known that the antigenic properties of bacterial vaccine are not thermostable, and heat above certain points or even lower temperatures applied over comparatively long periods destroy the essential constituents of a vaccine. The lower temperature applied to-day in the preparation of antityphoid vaccine means that one of the conditions to be fulfilled in the ideal vaccine is more nearly met; the typhoid bacilli in the vaccine used to-day are nearer the living organisms than they were a few years ago. The efficiency of such a vaccine has been proven by its use in the British and American armies.

There has been within the past few years a number of articles upon the strain or strains of B. typhosus that give the best results in terms of protective reaction. The principal ideas brought forth in these articles deal largely with three points: first, that a single properly tested strain is sufficient; second, that more than one strain, or a polyvalent vaccine, is best; and third, that typhoid vaccines should contain at least one strain of paratyphoid bacilli.

It is claimed by some that a vaccine made from a single strain of B. typhosus which has been proven to be efficient in terms of protective reaction, will protect against all other strains of this organism, regardless of their geographical location or their environment. Those who advocate the use of a monovalent vaccine do so for two principal reasons, a theoretical and a practical one. Theoretically, one might hold such a view upon the principle that the biological characters of B. typhosus vary but little in various parts of the world. I would not leave you with the impression that all cultures of B. typhosus are exactly similar biologically; much less would I have you apply such an impression to all other organisms, as for example, the gonococcus, where definite strains are known.

In practice the use of a monovalent vaccine gives sufficiently good results to be adopted by the British and United States armies. Nicholls of the United States Army covers the question well when he says that "heat-killed cultures are efficient, are safe, both as pertains to the individual inoculated and the possible infection of others." He does not claim that such a vaccine is the *summum* *bonum* in antityphoid inoculation, though he does say, "improvements may be made, but before our results are improved upon they must be equalled."

Some workers advocate the use of a polyvalent vaccine and even suggest that such a vaccine should be made from organisms isolated from cases in the community where it is to be used. Such a vaccine would no doubt be efficient and under certain conditions its preparation might be practical, but it would involve considerable work, and could scarcely be applicable to the inoculation of armies, men, or bodies of men, who must be mobile.

The Japanese have recently advocated and have been using a typhoid vaccine to which has been added one of more strains of para-typhoid bacilli. Such a vaccine has the advantage that the individual inoculated with it should be protected from infection with both typhoid and para-typhoid bacilli. Para-typhoid infections are more common than we generally think, and protection against them should be offered.

The size, number, and interval of the doses of typhoid vaccine are fairly well established. The United States Army, where vaccination against typhoid fever is compulsory, has adopted the following: they give three doses at intervals of ten days; the first dose is 500m.; the second, 1000m.; and the third 1000m. The British Army on the other hand gives but two doses at ten days interval. The size of the dose is the same as in the United States Army. From a conversation with Sir William Leishman I take it that he believes in giving three doses but, as the use of anti-typhoid vaccine in the British Army is not compulsory, he is of the opinion that it is better, as yet, to give but two doses and have a comparatively large number of men receive it, than insist upon three doses and have a proportionately large number of men refuse to take it.

Sensitization of an organism means the exposure of that organism to the serum of man or some lower animal that has been immunized against the organism in question. Sensitized organisms may be used as such, or after they have been sensitized, may be killed by one of the methods referred to above. Sensitization of an organism does not kill it but takes from it the properties that make it infectious for the individual inoculated. Those who advocate the use of sensitized cultures are largely the French, where Beresdka has been especially influential. He advocates the use of living sensitized organisms largely from the results of His and Metchnikoff's experiments with inoculations of the higher apes with typhoid bacilli. These investigators succeeded in producing lesions in the higher apes very similar to those found in man, and carried out experiments with the prophylactic inoculation of these animals against infection with typhoid bacilli. The result of their work, as it bears upon the question of prophylactic inoculation against typhoid infection, is briefly as follows: Heat-killed cultures, as they employ them, did not protect the higher apes against typhoid infection, while sensitized living cultures did. But too dogmatic conclusions can not be drawn from this work, since typhoid infection in the ape is both clinically and pathologically different from that in man.

It is probable that a living sensitized or a virulent culture is nearer the ideal vaccine than a killed culture. But in the light of recent investigations its use can not be said to be without dangers, not because there is any real danger to the individual who is inoculated with such a vaccine, but for at least two reasons: first, the possibility of carriers being produced; and second, the possibility of the sensitized organisms being given opportunity to become virulent. Recent investigations seem to show that certain lower animals may become chronic carriers of B. typhosus after inoculation with sensitized cultures of this organism. While this is denied for man until proof warrants its complete and unqualified acceptance, the use of such a vaccine should not be undertaken; there are too many carriers now to run the risk of producing even one more. If there is no danger to the individual inoculated with a sensitized vaccine, and no possibility of such an individual becoming a carrier, recent investigations have shown that conditions may arise whereby a virulent sensitized B. typhosus may become virulent. Sensitized B. typhosi, if planted upon artificial media, not only grow, but become virulent. A recent article from a member of the Medical Corps of the United States Army deals with a series of experiments bearing upon this point, and refers to the possibility of the containers of such a vaccine being broken in transit or in camp and the sensitized organisms which they contain finding suitable medium upon which to grow, thus making infection possible from them.

There is yet another method of preparation of anti-typhoid vaccine to which I shall only refer; a method whereby the organisms are killed with some chemical substance and the precipitated organisms suspended in some bland fluid, as normal salt solution.

There can be no doubt that typhoid vaccine offers a comparatively high degree of protection against typhoid fever. While this protection is not absolute, it is of a sufficiently high degree to warrant states, provinces, or municipalities assuming the responsibility of preparing and distributing typhoid vaccine to its physicians. I see no reason why its preparation and use should be placed upon the same basis as smallpox vaccine.

Prophylactic Inoculation against Cholera: Since Ferron in 1885 first introduced prophylactic inoculation against cholera, considerable advance has been made upon the question. The earlier workers upon anti-cholera inoculation thought that it was essential to use a living culture as a vaccine. Haffkine's method of inoculation differed from Ferron's in that he used a greatly-attenuated culture at the first inoculation, and one of higher virulence at the second. Kolle has shown, however, that cultures killed at proper temperatures give as good results as living organisms. The statistics in regard to the protection established by using anti-cholera vaccine warrants its use in instances of probable epidemics. By the administration of properly prepared vaccine and the application of efficient sanitary methods, cholera should not be allowed to spread as it once did.

The use of living cultures of cholera bacilli as an anti-cholera vaccine has even more disadvantages from the standpoint of public health than those cited in regard to living typhoid bacilli.

Prophylactic Inoculation against Plague (applicable only in the Bubonic type). The statistics of Haffkine, who did the pioneer work on this question, are so striking that the efficiency of the inoculation can not be questioned. The comparative mortality among the inoculated and uninoculated is from 11 per cent. to 41 per cent. for the inoculated, and from 50 per cent. to 92 per cent. among the uninoculated.

Anti-Dysentery Vaccine. The difficulty in the application of prophylactic inoculation against dysentery has been due to the severity of the reaction following the inoculation. Dead cultures are so highly toxic that the general use of them has not been well received. A new technique in the preparation of anti-dysentery vaccine, which does away with the severe reaction following its administration, will, it is hoped, result in the preparation of a vaccine that will be of much use in preventing this disease. The principle underlying the preparation of this new anti-dysentery vaccine is one of sensitization of the organisms. Such a vaccine has no severe reaction following its administration. As yet no opportunity has presented itself for the employment of such a vaccine on a large scale. I saw last summer in Sir William Leishman's laboratory the first lot of this vaccine, made for distribution among the British troops then mobilized for war. Dr. Alcock, who perfected the technique of its preparation, informed me that the vaccine I saw was to be sent to France the next day, but it was not to be used unless an epidemic of dysentery developed among the troops. In the event of such a misfortune, it was to be administered at once. Let us hope that practical test of its efficiency may not be now.

Prophylactic Inoculation against Tuberculosis. Since the use of preparations of vaccines derived from the tubercle bacillus have been largely used as therapeutic measures, I shall refer to them but briefly. That an anti-tubercle vaccine is efficient in its protective powers, the work of Meakins has shown. He was able to immunize rabbits against virulent tubercle bacilli by inoculation with attenuated cultures. Barbour has developed a technique by means of which he is able to isolate a single tubercle bacillus. By this means he and Webb have successfully immunized monkeys against tubercle bacilli. The dose begins at one organism and increases. They have been able to establish an immunity in the guinea pig against the human type of this organism to a sufficient degree to protect the immunized animal against a sufficient number of virulent organisms of this type to kill 12,000 guinea pigs. They have inoculated two children of tuberculous parents without any signs of tuberculosis developing in the children. As Meakins suggested, the results of prophylactic inoculation against the tubercle bacillus are efficient and practical.

Prophylactic Inoculation against Whooping Cough. The work of Bordet and Gengou and others has been generally accepted as establishing B. pertussis as the etiological factor in this disease. There have been some attempts at prophylactic inoculation against this disease by the use of an anti-pertussin vaccine. The French claim good results, but I am informed by letter that the experience of some physicians in New York has not been so encouraging. I have been unable to find out how and by whom the vaccine they used was prepared. It is just as important in bacterial vaccines as in drugs in general to know that a vaccine to be used contains the proper organisms in the proper proportion and that it has been properly prepared. As an example I will refer to a letter from Dr. Theobald Smith of the Harvard Medical School, who informs me that he has had an opportunity of examining cultures of an organism used by a commercial firm in the preparation of an anti-whooping cough vaccine supplied by them, and that he has found that the organism used in this instance was not B. pertussis, but the closely allied B. bronchosepticus, the etiological factor in canine distemper and a pneumonia occurring in guinea pigs. These two organisms are so closely related that they are distinguishable only by a few cultural reactions and by agglutination phenomena.

Prophylactic inoculation against Epidemic Cerebro-Spinal Meningitis. Sophian has shown that animals inoculated with a polyvalent anti-meningococcus vaccine develop protective bodies. There is reason to believe that such a vaccine would react similarly in the human and its use seems justifiable. This disease is not highly contagious, as only about 5 per cent. of secondary cases develop in houses in which it has appeared. It is well known that epidemic cerebro-spinal meningitis commonly appears among bodies of men, as armies that are massed together. Under such conditions a polyvalent vaccine would most probably be of benefit. It has been suggested that immune sera be given in conjunction with the first inoculation with anti-meningococcus vaccine. This is suggested on the basis that the passive immunity following the administration of specific sera should protect during the period immediately following the administration of the bacterial vaccine,—a period between the injection of the vaccine and the time when the body reacts to it in terms of protection. Such a procedure would seem especially advisable when dealing with physicians, nurses, and those who are exposed to the possibilities of infection at frequent intervals and over comparatively long periods.

In the animal world there are a number of prophylactic vaccines employed. I shall refer to but two of these, both of only recent application: a prophylactic vaccine against canine distemper and one against an epidemic type of pneumonia that develops in guinea pigs.

Prophylactic Inoculation against Distemper. Dr. E. Hamilton White has informed me of the attitude of one of the veterinary surgeons in Montreal in regard to the efficacy of the anti-distemper vaccine. He claims for it both preventive and curative properties.

Canine distemper is dreaded by dog fanciers and dog breeders. I am informed that the possibilities of young dogs contracting this disease interferes with dog shows and the field trials of sporting dogs. Canine distemper in a young bird dog may so greatly damage his sense of smell as to take a prospective fine field dog from field work and place him in the show class, or it may even ruin him.

Prophylactic Inoculation against Guinea Pig Pneumonia. There occurs an enzootic type of bronchopneumonia in guinea pigs that is quite fatal. We have lost fifty out of eighty pigs during one epidemic. Dr. Theobald Smith has shown that this disease is due to B. bronchosepticus, an organism closely resembling B. pertussis.

During the past winter our stock of guinea pigs was inoculated against this disease by the use of a vaccine prepared from a culture of B. bronchosepticus sent me by Dr. Smith. The entire stock was inoculated early in December, six weeks before the time the disease had developed in each of the past three years. No uninoculated controls were kept, so that definite conclusions as to the efficiency of the vaccination can not be drawn. It is encouraging, however, to note that we have not had an enzootic this year, the first year that we have not had at least one for four years. At a later date I hope to go into the question more thoroughly.

If one summarizes the present status of prophylactic inoculation with bacterial vaccines, there is abundant evidence to show that protection of varying efficiency may be obtained against a number of diseases. With the increasing application of newer technical methods of preparation the future of prophylactic bacterial vaccination is encouraging.

It seems unfortunate that prophylactic inoculation has been referred to as vaccination. To physicians it matters little whether it is referred to as vaccination or inoculation, but to the general public it is different. Vaccination to them means a procedure similar to that in smallpox vaccination with the sore arm and the resulting superficial ulceration. I have seen individuals who objected to anti-typhoid vaccination but gladly availed themselves of the opportunity to receive an anti-typhoid inoculation.

An amendment to the Medical Profession Act of Saskatchewan was read for the first time on May 25th. The purpose of the amendment is to establish reciprocal relations between the province of Saskatchewan and Great Britain. It provides that any person who is duly registered by the General Council of Great Britain may practise medicine in Saskatchewan upon payment of the necessary fees and production of satisfactory evidence that he is registered in Great Britain and of good character.

THE THERAPEUTIC EMPLOYMENT OF VACCINES

By J. C. Meakins, M.D.

AT the present time two separate and distinct methods of specific treatment of acute bacterial infections are in use. Either an immune serum, containing substances which render the infecting microörganisms comparatively harmless or neutralize their toxins, is administered; or an attempt is made actively to produce these immune substances in the human body by the use of vaccines.

Theoretically, both these principles are sound, and some very brilliant results have been obtained.

Unfortunately, many failures have been experienced, not so much on account of the fundamental principles being at fault as through trying to make all diseases conform to common modes of procedure. As time passes, it is becoming more and more apparent that the specific treatment of each disease must be worked out according to laws of its own.

As Dr. Rhea has pointed out, protection against certain diseases, such as plague and dysentery, was almost impossible by vaccination until the employment of the sensitized vaccines as prepared by Besredka. For many years it was held that the ideal method of vaccination would be living organisms. Now this is practicable, and the results are extremely encouraging.

It will be impossible for me to cover all the contributions on the specific treatment of infectious diseases which have been made in recent years.

First, a few words concerning the method of operation of vaccines and serums. A vaccine acts by stimulating the body to an increased production of protective properties against specific organisms or their products. The latter may be formed either during the process of growth of the organism, or after the death of the bacteria, when the protein of the bacterial body is split up into simpler but more toxic substances, such as albumoses or peptones. There has been no bacterium that I know of which has been proven to contain

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an endotoxin. It appears to me as reasonable to call the peptones derived from the digestion of beef, "endotoxins", as it is to call the split products of bacteria endotoxins. The only true bacterial toxins of which we know are those which are produced during the growth of the bacterium, as diphtheria, tetanus, botulismus, etc.

All curative sera are the result of vaccination, be it in the human or the horse. For instance, diphtheria anti-toxic serum is produced by vaccinating the horse with the diphtheria toxin. Many bactericidal sera have been produced in animals which have been successful experimentally, but have not given the results expected when used in human cases. The reasons for this are now being recognized.

In short, vaccination is the artificial production or stimulation of immunity in the patient during the course of the disease, while in sera we have preformed immune substances which act more or less as specific antidotes. Therefore, it may be stated that vaccines should be of most value in the treatment of the prolonged infections, such as furunculosis, chronic gonococcic lesions, whooping cough and typhoid; while serums should be especially efficacious in the treatment of the very acute diseases, as diphtheria, tetanus, pneumonia, and other streptococcic infections.

Whooping Cough. A few years ago, Bordet and Gengou described a bacillus associated with pertussis. This is very closely allied to the influenza bacillus in its cultural and morphological characteristics. But further experimentation has shown it to be a distinct variety unto itself, particularly so far as its immunilogical identity is concerned. Whooping cough is a disease especially suited to vaccination treatment on account of its prolonged course and notorious resistance to other forms of treatment. So very soon reports came from France, and later from other parts of Europe, and during the past year or so from America, of results from this method of treatment. As the majority of the cases were in children, small doses were used. The sensitized vaccine of Besredka was used in Europe, while the ordinary vaccines—killed by heat or phenol, have been used in America. The results are uniformly satisfactory, and with the sensitized vaccine, might be described as brilliant. An injection is usually given every fourth day, and after three or four doses, the cough disappears, and the patient remains perfectly well. As Dr. Rhea has intimated, a pertussis vaccine is now on the market: but if the result is not satisfactory, don't blame the method before you have ascertained that the organism used was really the Bordet-Gengou bacillus.

Typhoid Fever. Some years ago, I read a paper by Dr. Foster and myself before this society on the vaccine treatment of typhoid fever. Since then I have seen no reason to alter my favourable view concerning this method of treatment. The reports of others have been equally favourable, and its use is apparently becoming more and more general.

Typhoid fever seems to me to be particularly favourable for vaccine treatment. The onset is gradual, and a diagnosis can be made very early if modern methods are employed. But I wish to condemn the tendency there is to wait until the patient is in a very critical condition before vaccines are resorted to. During the first two weeks of the disease, typhoid bacilli circulate in large numbers in the patient's blood without producing any grave toxic symptoms. In the third week, they begin to disappear, and toxæmia of a more or less severe grade develops.

During these first two weeks, the body has been developing the power to digest the infecting organisms; during the third week, this digestion is very rapid, and the system is flooded with the toxic split products of the typhoid bacilli. Vaccination at this point is comparatively useless; in fact it is claimed to be detrimental. If vaccines, particularly the sensitized form, are used during the first ten days of the disease, the bacilli are destroyed more gradually, and a certain degree of immunity to the toxic products is developed. As a result of this early vaccination, the course of the disease is shortened, the toxic symptoms and prostration are lessened, the complications are fewer, and the mortality lower. I think that this is the most that could be expected of any method of treatment. It is not claimed that it is infallible, but it is certainly most encouraging. So much so, in fact, that vaccines should be considered a part of the routine treatment of typhoid fever as soon as a diagnosis has been made, and blood cultures should be used more consistently to attain this. Furthermore, vaccine treatment undoubtedly diminishes the frequency of relapses.

Gonorrheal Infections. For eight years, vaccines have been used with varying success in the treatment of gonorrheal infections. The chief objections to their use have been the violence of the reaction sometimes ensuing, the negative, and sometimes detrimental, effects in the acute stages of the diseases, and the uselessness of the treatment in the pelvic manifestations.

Recently the employment of sensitized vaccines has overcome many of these objections. Cruveillier and others have reported a considerable number of acute and chronic cases of gonorrhocal urethritis, arthritis, orchitis and epididymitis, with almost uniformly good results. A general reaction sometimes occurred, with slight fever, but did not last more than a few hours: the local reaction at the site of inoculation was slight, and the discharge and signs of inflammation began perceptibly to disappear at the end of forty-eight hours.

The number of cases which have been reported by this method of treatment is not large enough to draw any sweeping conclusions, but the results are extremely encouraging, and hold out hope that a valuable remedial agent has been added to the therapeutics of gonorrhea.

Pneumonia. Pneumonia, on account of its frequency, high mortality and unsatisfactory treatment, early attracted the attention of those interested in immunity.

It is now over twenty years since patients were first treated by serum obtained from immune animals. The practical results were very disappointing. Although it has been impossible to show any marked lowering of mortality in any large series of cases as treated, yet careful clinical observers have been impressed by the improvement witnessed in individual cases. Moreover, it was early shown that suceptible animals might be rendered resistant to pneumococci, and also that a small amount of this immune serum would protect other animals for a short time. This experiment is so striking and fundamental that there is no wonder that efforts to find methods of using this serum therapeutically in man have been persisted in.

Neufeld has shown that a certain amount of serum in relation to the body weight is required to protect. On the other hand, a slightly smaller amount of serum will not protect against a much smaller amount of pneumococci. In other words, such a serum does not obey the law of multiple proportions, and to be efficacious even against a mild infection, it must be present in the body in a given concentration. Reckoning from his experiments on mice, at least 75 c.c. should be injected in man, and naturally much more after the infection has persisted for any time. It is evident, therefore, that one reason why anti-pneumococcic serum has not been more efficacious is that it has not been used in large enough doses.

Dochez has shown that there is a maximum degree of infection against which no amount of serum, however large, is able to protect. This suggests that to get the best results, the serum should be administered as early as possible before the infection has reached an extreme grade.

It is also necessary to point out the importance of being sure that the case being treated is caused by the pneumococcus, and not by some other organism, as streptococcus, B. influenza, Friedländer's bacillus, etc. In the past, anti-pneumococcus serum has been administered indiscriminately in all cases of pneumonia, no effort being made to determine in the individual case the nature of the bacterium causing the infection. As all immune sera are specific, it is seen that cases caused by organisms other than the pneumococcus would be uninfluenced by this serum. Furthermore, Neufeld found that an anti-pneumococcus serum would protect against the strain used for immunization, and also against certain other strains, but not against all.

Cole, recognizing these points as fundamentally important, proceeded to investigate different strains of pneumococci obtained from different cases of pneumonia. He found he could differentiate four types. An immune serum produced in a horse by a strain of Type I had a specific action against all members of the type, but had no action on the organisms of any of the other types. In a like manner, immune serum produced by the injection of a member of Type II was specific for members of this type only.

Type III was the so-called pneumococcus mucous. It was found impossible to produce an immune serum for this organism.

Type IV comprised all strains against which the sera of types I and II were ineffective, and which did not have the characteristics of Type III. Animals may be readily immunized to any member of this group, and the serum of the immunized animal is protective against the race used for immunization. In no instance, however, has this serum been found effective against any other race of this group, or against the organisms of other groups.

So far as cultural and morphologic characters are concerned, no constant group-differences have been discovered between the members of Group 1, 2 and 4. By means of the agglutination reaction it has been found possible to group the various races into types in exactly the same manner as by protection experiments.

In seventy-four cases of pneumonia studied, the number of cases found to be due to organisms belonging to each of the four types are as follows:

$$\left.\begin{array}{ll}\text{Type I}\ldots\ldots\ldots & \text{47 per cent.}\\ \text{Type II}\ldots\ldots\ldots & \text{18 per cent.}\end{array}\right\}\text{65 per cent.}$$

$$\left.\begin{array}{ll}\text{Type III}\ldots\ldots\ldots & \text{13 per cent.}\\ \text{Type IV}\ldots\ldots\ldots & \text{22 per cent.}\end{array}\right\}\text{35 per cent.}$$

It is now evident that in studying the effect of an immune serum on patients with pneumonia, but slight conclusions can be drawn from its indiscriminate employment in all cases. First we must know the type of organism used for its production; and second, it must be employed only in cases due to organisms of this type. So far it has been possible to produce a serum of high protective power against organisms of Type I, and a second serum—only slightly less efficacious—against organisms of Type II. It has been impossible to develop an immunity against Type III and in Type IV it would be necessary to immunize against every obtainable strain of this group. But the cases due to organisms of this type are comparatively benign.

The following table is given by Cole to demonstrate the relative virulence of each type:

Type I	24 per cent. mortality.
Type II	61 per cent. mortality.
Type III	60 per cent. mortality.
Type IV	7 per cent. mortality.

Type III, although very virulent, occurs as a causative agent in only 12 per cent. of the cases investigated.

Therefore, the problem resolved itself into treating the cases of pneumonia due to organisms of Type I and Type II with serum 1 and serum 2.

Immmediately the patient came under observation, the pneumococcus causing the infection was isolated from the sputum by injecting a small amount into the peritoneal cavity of a mouse, or by puncturing the lung (this procedure produced no ill-effects). However the growth of the organism is obtained, the agglutination test is at once applied. If not agglutinated by serum 1 or 2, it is useless to undertake serum treatment. If, however, one of the serums agglutinates the organism, treatment may be commenced at once with the appropriate serum.

Cole has treated seventeen cases with serum. The first dose was 50 to 100 c.c. diluted half with salt solution and injected into the vein. This was usually repeated in twelve hours and subsequent injections given as the condition of the patient indicated.

Fourteen cases were due to Type I and three to Type II. In the seventeen cases there were two deaths—mortality 14 per cent. as against 42 per cent. in untreated cases.

This is not a large enough series of cases to draw any conclusions as to the efficacy of the serum as regards mortality, and other facts must be looked into. Likewise, the temperature charts are fallacious, although a general lowering of the temperature and a shortening of the course seemed apparent, and the lessening of the degree of intoxication was very manifest. More important than these clinical manifestations was (1) the disappearance of the organisms from the blood after the first injection; and (2) the appearance of immune bodies in the blood in considerable quantities after the first injection. These bodies do not appear in untreated cases until the critical fall in temperature.

In using anti-pneumococcic serum, three points are most important:

1. Early treatment,
2. Large doses of serum where it will have the best effect, i.e., intravenously,
3. Identification of the type of organism and the use of the appropriate serum.

Streptococcus. What has been said concerning the early work on pneumococcus immunity applies equally to the streptococcus. In the laboratory, anti-streptococcus sera have been produced for many years, and theoretically should be applicable to man. But a more careful study has shown that although a serum will protect an animal against the strain which has been used for the injections, it will not necessarily protect against other strains. Thinking to obviate this difficulty, sera have been produced by injecting into animals a number of different strains of streptococcus. As might be expected, the results have not been more encouraging than with the univalent serum. It is analogous to the old shotgun prescription. Without doubt, occasional very striking results have been obtained, even more striking than with anti-pneumococcus serum. Taking advantage of the specific immunity reactions which we find to occur amongst strains of the same types of organism, which cannot be differentiated by other means—as the pneumococci and meningococci—some advance is being made in separating the different strains of streptococci according to their phagocytic susceptibility. A serum produced by the injection of one strain of streptococcus, while it will promote phagocytosis of this strain, and perhaps several others, will not phagocytize the majority. As the degree of phagocytic power and protection go more or less hand in hand, future work may resolve the streptococci into definite immunilogical groups as found in the pneumococci.

In the meantime, anti-streptococcus serum should not be ignored in treatment. It should be given as soon as a bacteriological diagnosis has been made. Also, the greatest concentration at the earliest time possible is always to be desired, and large doses (100 c.c.) should be given intravenously, as it takes 24 to 48 hours before a subcutaneous injection renders its full effect.

It must always be borne in mind that a serum must be active in order to produce results, and that some anti-streptococcus serums, which contain no anti-streptococcic bodies, have been found on the market.

As regards the treatment of streptococcus, blood infections by vaccines, but little success has been obtained by the ordinary methods. However, in the last two years several important series of cases have been reported where sensitized vaccine was used. The results were extremely good, especially those of Gordon (Bart's), who reports seventeen cases with five deaths; all of the mortalities had either meningitis, empyæma or peritonitis, or some combination. The twelve recoveries were all severe cases, in over half of whom the streptococci had been isolated from the blood.

Scarlet Fever. Of all the diseases that streptococci are associated with, scarlet fever is one of the most important. That streptococci cause it, there does not seem to be any definite proof, but that they are present as a very troublesome complication, must be admitted. Any reasonable attempt at the specific treatment of scarlet fever should be encouraged. During the past year, such attempts have been reported. Schultze of New York has described a micrococcus being always present in large numbers in the pharynx of scarlet fever patients. This organism he has called Micrococcus S. I will not discuss the bacteriology, but will briefly state the results as reported by Schultze and Goldberger.

A polyvalent heat-killed vaccine of streptococcus and micrococcus S. was prepared and given in doses of 400,000,000, and repeated in two days if necessary. One hundred and twenty-eight cases were treated, with a mortality of 1·5 per cent. The results observed after the inoculation were: a crisis in most of the cases within forty-eight hours, and almost uniformly a marked improvement in the general condition.

Keefer and Ferry, of Detroit, report one hundred and six cases treated in the same manner. The results are about the same.

Having no experience with this vaccine, I only mention it for what it may be worth.

The serum therapy of scarlet fever has seemed almost hopeless. Reiss has attempted a unique experiment. He does not approve of the commercial serums for this disease (he is not alone in this): he urges the preparation of the serum on the spot in the laboratory connected with the scarlet fever ward of a public hospital. He has applied the method in forty severe and extremely severe cases of scarlet fever, including several children who seemed moribund. A sudden and complete transformation of the disease followed, convincing the most sceptical of the advantages of the serotherapy. The serum from at least three scarlet fever patients at the third or fourth week of the disease was mixed, and after adding five drops of a 5 per cent. solution of phenol to each 50 c.c., the ampulla was fused and kept on ice. The serum from each donor was tested for the Wassermann reaction and bacterial content beforehand. The dose for the serotherapy was 50 c.c. for a child and 100 c.c. for an adult, injected into a vein.

Tetanus. The prophylactic value of anti-tetanic serum is established. That tetanus anti-toxin properly used may save the life of a patient in whom tetanus has already developed, should be more generally recognised, and the treatment employed in every case at the earliest moment. Every hour lost before the giving of the anti-toxin decreases the chance of saving life. There is every reason to anticipate that with the proper use of anti-toxin, a mortality considerably lower than the present will be obtained.

It is important that the full effect of the anti-toxin should be obtained immediately, and this may be accomplished by giving large doses in the following manner: 3,000 to 5,000 units intra-spinally, and 10,000 to 20,000 units intra-venously, at the earliest possible moment—after symptoms of tetanus appear. On the following day, the intra-spinal injection may be repeated, and on the fourth or fifth day, 10,000 units should be given subcutaneously to maintain the anti-toxin content of the blood. This use of anti-toxin in no respect replaces other necessary recognized non-specific methods of treatment. Surgical treatment of the site of infection should be instituted at once, and all other well-known symptomatic treatment rigidly observed.

But the specific treatment of tetanus is of no value if the serum contains little or no anti-toxic properties. In 1906, Weaver investigated the therapeutic and protective value of the anti-tetanic serums on the market in the United States. His results were most astonishing. Many serums were absolutely useless; many more nearly so, and only a few were of any value whatever. Similar results were obtained with anti-streptococcus serums.

Our poor results in Montreal with anti-meningococcus serum since the Rockefeller Institute has been unable to supply us, would substantiate this in another direction, while Dr. Rhea's reference to pertussis vaccine is a glaring instance of ignorance on the part of those who manufacture serums and vaccines.

Gentlemen, how is it that our government spends large sums of money to protect our sheep, and our pigs, and our oxen, and absolutely nothing towards the human animal? There is no inspection or control of biological products for human use in Canada; and furthermore, the medical profession as a whole does not seem to realize that this is most urgently necessary.

In closing, I would like to make the following suggestions:

1. The government supervision of serums and vaccines;
2. A more interested and charitable attitude towards this form of treatment by the profession;
3. Its early and energetic employment if it is going to be used at all, and not as a last resort.

THE following doctors have joined the Royal Army Medical Corps: Drs. E. B. Lang, R. E. Johnston, and F. Brodie, of Vancouver; Drs. J. S. Chisholm and W. P. MacKasey, of Halifax; Dr. H. M. Godfrey, of Marshfield, Prince Edward Island; Dr. S. R. Johnston, of Dartmouth, Nova Scotia; Dr. J. G. F. Heal, of Guysboro', Nova Scotia; Dr. H. S. Moore, of Kentville, Nova Scotia; Drs. Nathaniel Macdonald and W. W. Patton, of Cape Breton; Dr. G. W. Whitman, of Stellarton; Dr. Arthur Maxwell Fisher, of New Brunswick; Drs. Thos. F. Cotton, Fraser Gurd, W. S. C. Gowdey, A. M. Fisher, W. J. Grant, and R. R. Scott, of Montreal; Dr. A. J. Lomas, of Longeuiel, Que.; Dr. Ronald R. Scott, superintendent of the Western Hospital, Montreal; Dr. L. D. MacIntosh, of Hartland, New Brunswick; Dr. G. A. Ramsay, F. H. Bowen, J. Thornley Bowman, of London, Ontario; Dr. W. J. Hicks, of Wilkesport, Ontario; Dr. W. G. Laird, of Southampton, Ontario; Dr. C. R. Totten, of Windsor, Ontario; Dr. G. C. Bell, of Merlin, Ontario; Dr. G. C. Brink, of Port Stanley, Ontario; and Dr. T. P. Bradley, of Sarnia, Ontario.

FAT METABOLISM AND ITS RELATION TO ACIDOSIS

By V. H. Mottram, M.A.

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THE first observations upon which our present ideas of fat metabolism are based date back as far as 1883 when Lebedeff[1] as the result of autopsies on patients who had died of phosphorus poisoning, noticed that emaciated subjects did not show that large amount of fat in the liver that is a normal characteristic of phosphorus poisoning. From this he was led to postulate that the fat in the liver was not formed on the spot from protein break-down, but came from the fat dépôts. It was a fat infiltration and not a fatty degeneration. This theory was put to the test of experiment. He filled the fat dépôts of dogs with an abnormal fat (linseed oil or mutton fat), then poisoned the animal with phosphorus and found that the liver contained the abnormal linseed oil or mutton fat in large quantities. This was a direct confirmation of his theory that the excess of fat in the liver as the result of phosphorus poisoning came from the fat dépôts. Though the work was not ideal from the chemical or experimental standpoint, it has been substantiated by all subsequent research and it is a testimony to Lebedeff's ingenuity that his technique has been followed until quite recently.

Rosenfeld,[2] in leading the attack of the Bonn school upon the Munich school of physiology, has widened and deepened Lebedeff's findings until they include an enormous number of cases in which the liver, heart and kidneys contain an excess of fat. Using dogs in which the fat dépôts had been filled with fat foreign to the animal, he proved an infiltration of the liver in phosphorus, arsenic and antimony poisonings, in phlorrhidzin and pancreatic diabetes, in chloroform, alcohol, and CO poisoning, and in the livers of geese prepared for the manufacture of *paté de foie gras*. In these cases the liver is infiltrated with fat from the fat dépôts: it is not "degenerated."

Read at the meeting of the Montreal Medico-Chirurgical Society, held on March 5th, 1915.

The next important step is due to Leathes[3] and his co-workers, Hartley,[4] Kennaway[5] and Meyer Wedell.[6] So far the assumption had been made that liver, heart and kidney fats were all of the nature of dépôt fat. Early investigations by Leathes[7] of the alcohol-chloroform extract of the liver showed that it contained large quantities—(40 per cent.)—of substances very definitely not fat. When these impurities were removed, the remaining substance, whether fat or fatty acid, was unlike that obtained from the fat dépôts.

Fat from the fat dépôts—the subcutaneous tissue, omentum, mesentery, adipose capsule of the kidney, around the optic nerve, and other nerves, and the pericardium—consists essentially of triglycerides of fatty acids such as palmitic, stearic and oleic acids. One molecule of glycerine combines, with the loss of three molecules of water, with three molecules of fatty acid to form one molecule of fat. The normal fats and oils of foods vary as regards the proportional amounts of the different fatty acids. Olive oil contains much oleic acid, lard less, and mutton-fat but about two-fifths. Butter fat is remarkable in containing a considerable percentage of fatty acids (butyric, etc.) volatile at the temperature of boiling water. The relative amounts of oleic acid can be gauged by the amount of iodine the fat can absorb. 100 grams of pure oleic acid can absorb 90 grams of iodine, and this figure is spoken of as its iodine value.

In general the fats of the fat dépôts are the fats of the foodstuffs eaten together with saturated fats manufactured from carbohydrates, so that each animal will have fats in its fat dépôts of an iodine value *below* that of oleic acid. But the fatty acids (and therefore the fats) of the liver, heart and kidney, have much higher iodine values. They are more unsaturated. 100 grams of liver fatty acids unite with about 135 grams of iodine.[8]

In this they are much more like fish oils and many clinicians assume that the value of cod-liver oil is due to these unsaturated fatty acids, and so reject Newfoundland cod liver oil, which becomes oxidised in its manufacture by exposure to air, in favour of Norwegian oil which is manufactured under an atmosphere of carbon dioxide. One fatty acid isolated by Hartley[9] from pig's liver (and presumably present in human liver) had before been obtained from fish and blubber oils only. Tissue fats, as opposed to dépôt fats, are unsaturated and oxidisable and closely resemble fish oils.

This discovery puts a simpler method in our hands of testing whether a tissue such as the liver is infiltrated with dépôt fat or not

If infiltrated, as the percentage of fat (or fatty acid) increases, the iodine value of those substances decreases. This has been shown to be the case in human livers by Hartley and Mavrogordato[10] in a series of analyses of material for the post mortem room, the iodine value bearing an inverse ratio to the percentage of the fatty acids. It has been confirmed by the writer working on bullock's liver and the clinching proof recently adduced by Imrie.[11] The last mentioned researcher constructs a theoretical curve on the following basis. He analysed a large number of human livers of patients from the General Hospital in Toronto, and found the average percentage of fatty acids and their iodine values in apparently normal livers. This forms the starting point of the curve. He then assumes that if the fatty acid doubles in amount, half will be from the fat dépôts and half that originally in the liver. The iodine value of fatty acids from the normal human liver is about 136; that from the dépôts 65. Theoretically, when the fatty acid doubles in the liver the new iodine value should equal $(136+65) \div 2$. When it trebles $(136 + 2 \times 65) \div 3$, and so on. It is easy thus to construct a theoretical curve. Taking the actual values in his analyses and comparing them with the curve theoretically obtained there is a remarkable correspondence between the two. This cannot be a chance correspondence and is undoubtedly to be regarded as a clear proof of an infiltration of the liver with dépôt fats.

But if we apply the same method of investigation to heart and kidney infiltrations we find no such correspondence between theory and fact. The iodine values actually observed are always higher than those theoretically deduced. The simplest interpretation is that the organs when infiltrated are infiltrated partly with dépôt fats and partly with fats that are already desaturated. Whence do the latter come? If we accept Leathes' theory of the function of the liver in fat metabolism[3] the explanation is clear. Leathes believes, and brings a number of cogent reasons to the support of his theory, that when fat is to be metabolised it proceeds first to the liver, there to be desaturated, and then on to the other organs to be utilised in the productions of energy.

On Leathes' view, as well as on Rosenfeld's,[12] the state of the liver when infiltrated, is physiological and not pathological. For this there is the morphological evidence adduced by the writer. In no case in the large physiological infiltrations observed has the nucleus of the cell suffered, although the cell may contain as many as seven fat globules, each as large as the nucleus.

This is further substantiated by the following argument:

The diseased states of the body that are accompanied by fat infiltration of the liver are very diverse and unlike. For instance, we may have it in diabetes, phosphorus poisoning, chloroform and alcohol poisoning, pernicious diarrhœa, stenosis of the pylorus, emaciation, etc., etc. *Where you have a symptom common to many widely different diseases, that symptom, however important from a clinical aspect, is not important as regards the etiology of the disease.* The excess of fat in the liver in these cases of fat infiltration is then a secondary phenomenon following on some primary disturbing factor. The common factor of the above pathological conditions is undoubtedly a disturbed or deficient metabolism either of protein or carbohydrate. In diabetes carbohydrate metabolism is disturbed; in poisoning there is excessive protein metabolism with wastage of tissue; in the other cases there is a real or virtual starvation of the body. In all cases, the fat reserves must be mobilized to supply materials for the production of energy and it passes first to the liver there to be desaturated. The fat is in the liver for physiological, not pathological, reasons.

Experimental proofs of this are to be found in work by Rosenfeld,[14] Leathes[15] and the author.[16] Rosenfeld finds that if and when he has produced a fatty infiltration of the liver by means of phlorrhidzin he gives the animal a meal rich in carbohydrates, the infiltration clears up within one day. This could hardly be the case if the infiltration denoted a pathological state of the liver. The author,[13] too, has found that whereas one day's hunger will cause the liver of Belgian hares to infiltrate, a second day's hunger will denude the liver of the infiltrated fat. Presumably the fat has been handed on, after a temporary sojourn in the liver, elsewhere. One day's hunger cannot be held to produce a pathological state of the liver especially as a further day's hunger brings the liver back to the normal morphological or chemical state. The same is true of the infiltration of the liver during late pregnancy and early lactation demonstrated by Coope and the writer[17] in rabbits. Only by a stretch of terms can that state be called pathological and there is no morphological evidence that the liver is then pathological. Similarly, in excessive fat feeding, the liver has been shown by Opie[18] morphologically and confirmed chemically by Leathes[19] and by the author,[20] to be infiltrated with fat. Whenever, then, there is abundant fat metabolism, the liver is found to be infiltrated with fats, presumably to be handed on elsewhere when worked up.

Recent unpublished work by Imrie, which he kindly allows the writer to quote, demonstrates the fact that the fœtus is greedy for unsaturated fats and gives an explanation of why the liver is infiltrated in pregnancy. The material is being worked up for the benefit of the fœtus. That chick embryos utilize unsaturated fatty acids has been shown by Eaves[21] and by the writer[22].

The clinical bearing of this is obvious. Ordinary fat when the body is diseased, as in chloroform poisoning, has been shown by Opie[23] and Alford to be a dangerous food. When energy is wanted by the body in emergency as the result of some pathological condition it would be well to save the liver trouble by feeding with fish oils. Cod liver oil has already been shown to be useful in diabetes. But cod liver oil is not the only fish oil available. Sardines and herrings contain high percentages of unsaturated oils and have the advantage of being palatable though reputed to be indigestible. Fish roes contain fats[24] even more unsaturated, and there is metabolic as well as æsthetic grounds for the consumption of caviare. Fish oils we know are readily transported to the eggs of wild fowl for they are wanted for the nutriment of the embryo. Probably the same would happen, in view of Imrie's work, in pregnancy, and fortunately it does not matter whether or no the baby tastes of fish.

One subsidiary point of clinical importance seen in the work on pregnant animals' livers is that the infiltrations are greater if the animals investigated have but recently come from the vendor. Isolation, quietude and good dietary reduce the amount of infiltration seen at full term, suggesting that to the ordinary infiltration accompanying pregnancy there may be superadded an infiltration due to emotional excitement and a keen struggle for existence. This gives us an experimental confirmation of the well-known harmful effects of emotional disturbance during pregnancy.

The final portion of this paper has as subject the relation of so-called acidosis to fat metabolism. By acidosis, in its strictest sense, is meant an increase above the normal of acid (hydrogen) ions, in the blood. But it is generally used in the sense of an appearance of the acetone bodies (β hydroxybutyric, acetoacetic acid and acetone) in the blood with concomitant appearance of these substances in the urine. They are not present in the blood of normal adults, but in children they are frequently present to a small but definite amount.[25] But they are present in many diseases and may also be produced by experimental means. They are present in diabetes mellitus, sometimes the enormous amount of 100 grams β hydroxybutyric acid being passed a day.[26] They are present in chloroform poisoning, phosphorus poisoning, stenosis of the pylorus, hysterical vomiting, typhus and dysentery, etc., etc. In more physiological conditions we find them during hunger, normal pregnancy, carbohydrate hunger[27] and excessive ingestion of fat; in fact in most of the cases in which the liver is infiltrated with fat. They are present, then, in widely different diseases and so cannot (by the criterion used above) be considered as anything but a secondary symptom of any of the diseases in question. From an etiological point of view they are irrelevant, though of great clinical importance. What is then the meaning of acidosis? If we compare the diseases and states of the body quoted immediately above in which we have acidosis, and those in which we have an infiltration of the liver it will be seen that they are practically identical one with the other. E.g. $C\ H\ Cl_3$ poisoning, diabetes, pregnancy and hunger are common to both sets. The occurrence of acidosis is parallel to the occurrence of fat infiltration of the liver. It is present when for any reason there is a large increase in fat metabolism and everything suggests that there is a causal relation between them—pancreatic diabetes in the dog being a possible exception.[28]

As Magnus Levy[29] has shown, in severe diabetes protein could not be the source of the acetone bodies. There was in his cases not enough carbon in the protein metabolized to account for the acetone bodies. It could not be from carbo-hydrate and must therefore be formed from fat.

Most amino-acids given to diabetics yield carbohydrate with the exception of leucin and tyrosin.[30] Saturated fatty acids (particularly butyric acid from butter) when given to diabetics increase the acetonuria.[31] When carbohydrate is cut out of the dietary the acetonuria follows, after a latent period of about six hours, the ingestion of fat.[32] In hunger, acetonuria becomes marked when the stores of carbohydrate are exhausted.[33] For these reasons it is clear that the normal source of the acetone bodies is to be found in fats.

Of the tissues that might be responsible the liver is found to be the only one which, on perfusion with fatty acids, yields acetone bodies,[34] consequently we must explain acetonuria as being due to an over-forced activity of the liver. It is suggested that the liver, not having sufficient time to desaturate the fats, breaks them down to β hydroxybutyric acid and acetoacetic acid in which form they escape into the blood, the acetoacetic acid spontaneously liberating acetone. Why the liver fails to complete the oxidation we do not know, but we do know that carbohydrates decrease acetonuria and that in acetonuria there is excessive fat metabolism.

If then we explain acidosis by overwork in fat metabolism on the part of the liver, it would be well in such a case to ease off the work either by giving carbohydrates, which in many cases are efficacious, or, if these are contraindicated, by the use of fish oils. Much experimental work yet remains to be done on the oxidation of such oils by the body, but in the light of the work at present before the world, we may predict that they will be valuable in acidosis. Certain unsaturated acids, such as oleic and erucic, are said not to increase acidosis.

To sum up, we may say that in the light of our present knowledge, excessive fat metabolism is related with fat infiltration of the liver and with acidosis. The former is physiological and not pathological and is an expression of the function of the liver in fat metabolism: desaturation. The latter, acidosis, is the result of the fatty acid pursuing an abnormal path of metabolism, possibly as a result or overwork of the liver. In both cases increase of carbohydrate in the diet is advisable and, if these cannot be tolerated, fish oils, but not ordinary fats, are indicated.

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Case Reports

A CASE OF HÆMORRHAGIC CHICKEN-POX

By D. Grant Campbell

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THE following case is of interest on account of the rarity of the type and because there was an opportunity for a post-mortem examination.

M. S. was born on September 5th, 1914, and was admitted into the Montreal Foundling and Baby Hospital on September 15th following. On admission the infant appeared to be healthy except for a few skin blemishes, which disappeared rapidly under ordinary cleansing measures. She increased gradually in weight and strength and had the appearance of a healthy child. On January 2nd, 1915, a child was admitted to the hospital who two days later showed a typical varicellar eruption and was immediately isolated. The contagion spread, however, and most of the infants and one of the nurses have since acquired the disease.

On February 25th, 1915, M. S. gave the first indications of the disease (a few spots) and two days later the temperature rose to $102\frac{2}{5}°$, but fell to normal in less than twenty-four hours. On March 2nd, the temperature again rose suddenly to 102° and remained up till just before death. On March 3rd, at 9 a.m., the eruption became hæmorrhagic, the pustules forming the centre of small purple areas one-fourth inch in diameter. At the same time there was a slight vaginal discharge of blood (enough to stain the clothing) and at intervals all morning there was epistaxis, the blood being bright red. At 9 p.m. (twelve hours from the onset), a sharp hæmorrhage occurred from both mouth and nose, fully six ounces being lost. Various measures were tried to check the hæmorrhage with some temporary benefit and the baby rested quietly during the night but took no food, there being slight bleeding from the nose most of the time.

At 9 a.m., on March 4th, the child had a perfectly normal stool accompanied by a good deal of tarry blood, but no fresh hæmorrhage.

The baby died at 11.30 a.m., less than twenty-seven hours from the onset of hæmorrhagic symptoms.

Permission for an autopsy was obtained and Dr. Rhea kindly undertook it for us at the General Hospital.

The autopsy report is as follows:

The body is that of a fairly well-developed, but poorly nourished white female child, 60 cm. long. Rigor mortis is complete. There is very little post-mortem lividity. The pupils are equal and 5 mm. in diameter. There is no œdema. The superficial lymph nodes are not enlarged. The right external auditory meatus is normal. The left is filled with bright red clotted blood. Similar blood is seen in the nostrils. The skin shews lesions of irregular distribution, of various sizes, of different color and general character. The lesions are larger and most numerous over the back. There they vary in character, and representative types of the lesions found elsewhere in the skin are present over the back. The smallest lesions are seen as bright, small hæmorrhagic points, which are not elevated. On section, the hæmorrhagic area is very superficial. The remaining lesions vary in size to about the extent noted in chicken-pox. These lesions vary from 2 mm. to 1 cm. in diameter. They are all deep red, rather firm, and on section, contain a blood-tinged fluid. A few of the larger ones shew slight umbilication. On section, only the most superficial portions of the skin are involved. Besides these more elevated areas, there are a few lesions which are well dried up. Collectively, there are not over one hundred of the elevated lesions. (Specimen at McGill Museum.)

Peritoneal Cavity. The peritoneum is smooth throughout. There is no free fluid. There are a very few fine sub-peritoneal hæmorrhagic points, the largest not over 2 mm. in diameter. These are most numerous about the base of the mesentery on its inferior aspect.

Pleural Cavity. The pleura is smooth throughout. There is no free fluid. There are numerous very fine, sub-pleural hæmorrhagic areas, similar in character to the few already seen in the peritoneal cavity.

Pericardial Cavity. The pericardium is smooth. There is no excess of fluid. There are a number of small hæmorrhagic points under both the visceral and parietal pericardial layers, most numerous about the base of the heart.

Heart. Normal, save for the sub-pericardial petechia already mentioned.

Lungs. Normal, except for a few small sub-pleural petechiæ.

Spleen, Liver, Pancreas, Adrenals, Kidneys, Aorta, Genital Organs: No gross pathological lesions.

Gastro-Intestinal Tract. The œsophagus is normal. The mucous membrane of the stomach shews a very few fine red points similar to those seen in the skin and serous cavities. The remainder of the intestinal tract is normal. No hæmorrhagic areas or definite bleeding points are found. The lymphatic elements do not shew hyperplasia.

Head. The calvarium and scalp are normal. The dura is not abnormally adherent. There is no evidence of violence. The membranes are normal. The brain weighs 650 gms. There is very slight excess of apparently normal spinal fluid. There are a number of small hæmorrhagic points similar to those seen in the skin and serous cavities. These are most numerous about the base of the brain, especially in the inferior surface of the cerebellum. The mastoids are free from blood. Both middle ears and external auditory canals are filled with clotted blood. Both tympanic membranes are intact. The sphenoidal and ethmoidal sinuses are normal.

Anatomical Diagnosis. CHICKEN-POX, HAEMORRHAGIC, (VARICELLA HAEMORRHAGICA).

The chief features of interest are: (1) The rarity of the condition; (2) The serious prognosis; (3) The differential diagnosis.

The condition appears to be very rare considering how universal chicken-pox is. Allbutt's "System of Medicine"; Sir William Osler in his "Practice of Medicine" and Lockwood in his, are the only authorities whom I have been able to discover who mention it. In the literature there are a few cases on record, one of which is reported in the first number of the *British Medical Journal* for this year, in which case the child, aged three and one half years, recovered.

The prognosis is very grave and the few cases I have been able to discover nearly all ended fatally.

The differential diagnosis in this case was not difficult. It was one of an undoubted epidemic of varicella and the patient was kindly seen by Professor Blackader and Dr. J. E. Laberge (contagious diseases officer) who both confirmed the diagnosis.

Editorial

PATENT MEDICINES AND INFECTIOUS DISEASES

AT a recent meeting of the Ottawa Board of Health, when the question of the epidemic of diphtheria, then prevalent, was being discussed, one of the members of the board drew attention to the fact that a certain medicine called "Diphtherine," which was advertised as a cure for diphtheria, was being widely used. He suggested that in this epidemic it was partly responsible for the wide spread of the disease, four hundred and fourteen cases having occurred in six months. We feel that the point was well taken and that the sale of patent medicines professing to cure infectious diseases should be prohibited by law.

That the use of a patent medicine for the cure of infectious diseases must inevitably result, indirectly, in the spread of the disease cannot be questioned, when one considers the conditions under which this class of secret remedies is used. Recognizing the ease with which the exanthemata are transmitted, we have laws which make it compulsory to notify the public health officials of the existence of all cases of infectious disease in order that they may be quarantined, and the public guarded against their spread. But this duty of notifying the health department of his district of the existence of such disease, falls upon the doctor who discovers it; and the principal value of a patent medicine in the eyes of the ordinary layman lies in the fact that it enables him to dispense with the services of a physician. Is it to be expected that heads of families are sufficiently conversant with these laws to obey them? Even if they are, have they the special knowledge required to recognize these diseases in order to notify the proper authorities of their presence in the community?

Patent medicines are almost invariably cure-alls, and in most civilized countries now, including our own, the government undertakes to exercise some restriction over their indiscriminate sale by demanding that they be registered before they can be put on the market. A formula, giving the exact composition of each remedy, has to be submitted to the proper department, where the medicine is given a serial number and allowed to be sold, if it is found to contain nothing considered deleterious to health. This protects the public in a measure from dangerous drugs being dispensed in a secret nostrum. When, however, the use of such medicines endangers the health of the community at large, it is not enough to ensure that the so-called specific contains only harmless ingredients; the evil effects of its use in defeating the purpose of the laws aiming at the control of infectious disease must be taken into account, and this should be recognized and a licence refused for this reason.

When a patent medicine is used for a non-infectious disease, if it is worthless, as in generally the case, it does not increase the sum total of disease. The victims of misplaced confidence are the individuals who resort to its use and the general public does not suffer. There is then a vast difference between permitting the sale of an ordinary cure-all and a cure for infectious diseases.

That the medicine in question, Diphtherine, is harmless in so far that it contains no poisonous drugs, is evident from the directions given for its use. These state that it is to be used as a gargle only, except in the case of children too young to have learnt this method of cleansing the throat, when a teaspoonful is directed to be given internally every hour. On the other hand, the danger from its use by the public in general is enhanced by the fact that, though one is told how to recognize diphtheria clinically, the individual who has no confidence in his power to do so even with this help, has his difficulties solved by the statement that it is equally efficient and a sure cure for the sore throat of scarlet fever, measles, whooping cough, croup, and other throat and lung conditions not of an infectious nature.

Can anyone believe that, recognizing the danger from such a course, the authorities would allow to be placed on the market a sure cure for smallpox? Yet these more common and less dreaded forms of the exanthemata kill their thousands to the few that succumb to smallpox.

TUBERCULOSIS IN CHILDREN

OF late years the suggestion that pulmonary tuberculosis in adult life is a recrudesence or lighting up, after years of quiescence, of an infection acquired during childhood, has been gaining more adherents. Belief in the possibility of the sudden outbreak of an old acquired focus of disease, years after it had ceased to manifest any clinical evidence of its presence, coupled with the almost universally accepted statement that as many as 90 per cent. of children at the age of puberty were infected with tubercle, tended to give force to this hypothesis. Hence, the recently published statistics of Veeder and Johnston, of St. Louis, which appear in the June number of the *American Journal of Diseases of Children*, are of interest, especially as they show a wide divergence from the results obtained by von Pirquet and Hamburger in Vienna.

The frequency of primary pulmonary tuberculosis in children under five years old has been a much debated question owing mainly to the evidence having to rest upon clinical signs and skiagrams. The presence of tubercle bacilli in the sputum cannot be determined for obvious reasons, and the interpretation of the physical signs and of the Roentgen picture is necessarily biassed by the fixed belief of the observer in the frequency with which this form of tuberculosis occurs in early life. In the diagnosis of doubtful cases one must be able to exclude the more common disease before one can conclude definitely that one is dealing with the less common.

It is true that in those cases where the disease has become dessiminated throughout the body, and has taken the miliary form, at autopsy the pulmonary lesions can often be shown to antedate those in other organs; but autopsies, except in such generalized cases, are not commonly obtainable. Clinicians agree that the utmost reliance can be placed upon the von Pirquet and tuberculin tests for determining the presence of a tuberculous lesion; but whether it is active, latent, or healed can only be decided by clinical examination. Any enquiry then into the proportion of children, other than those with known tuberculous disease, who give a positive reaction to these tests proves of value in determining the frequency of tuberculosis early in life in the cities of this continent as compared with those of the old world.

Working amongst the same class of patient as those from which the Vienna statistics were compiled, namely the, poorer classes of society, Veeder and Johnston obtained a very much smaller percentage of positive results. Of 1,321 children from a few months up to fourteen years of age, the percentage rises gradually from 1·5 in children under twelve months to 36 per cent, for the period of ten to fourteen years, when recognized clinical cases of tuberculosis are excluded; and to 44 per cent. when cases of clinical tuberculosis are included. Hamburger and Monti obtained a positive result in 94 per cent. of children between these ages and von Pirquet 80 per cent. though the latter used only the test which bears his name. As in both the Vienna and St. Louis cases all the children on whom the tests were made were in hospital for some pathological condition, the percentage of children in the whole community infected with tuberculosis is probably much less than these figures indicate.

DETERMINATION OF SEX

SELECTIVE reproduction was a simple matter to Deucalion and Pyrrha. Their method is set forth without impropriety in the school books. But so far both science and imagination have searched in vain for the pebbles which they used. Plausibly infallible receipts for producing male or female offspring at will have never been lacking, but not one has long survived the test of independent research or unprejudiced practical application. The rules are empirical, and the data on which they are based are inaccurate or insufficient. Moreover, the uncertainty of so many factors such as the relation between ovulation and menstruation, and the interval between insemination and fertilization, leaves a loophole for escape from whatever objections may be urged against any hypothesis, which, in fact, nothing but a large body of reliable statistics could prove. After all, the chances of a successful prognosis of sex are mathematical, and practically even.

The modern scientific theories of sex fall into two groups, the physiological and the morphological. In the former group the nutritional theories are not at present in favour, but an interesting correlation of sex with metabolism is attracting attention. It is evident that throughout nature, male characteristics are preponderatingly active and catabolic; female characteristics on the other hand, are passive and anabolic. A book by Dr. T. E. Reed, published last year,* formulates an ingenious method of voluntary selection of sex on this basis. He has found that there is a definite lunar rhythm to be observed not only in menstruation, the classical example, but in many other functions, particularly in the fluctuation of the temperature and other symptoms in the course of the infectious diseases, and in the progress of labour. In labour the rhythm, Dr. Reed believes, is tidal, approximately six hours, a catabolic active period being followed by an anabolic period of rest. His obstetric records led him from this to the idea that the ovum has this same rhythm, and if fertilized during the catabolic phase, for instance, will result in a male. Moreover, these tidal periods are coincident in all persons in the same locality; consequently the theory can be put to the test; and the author claims to have had it tested successfully. In a word, prospective parents who may have a preference as to the sex of their offspring, are recommended to be ruled by the tide-tables for their latitude, if the intricacies of the more accurate Nautical Almanac are beyond their comprehension!

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*Sex: Its Origin and Determination. Rebman Company.

Passing to the morphological data, we leave the theories of voluntary selection and are on the more scientific ground of the biologist. But here, too, the findings of one observer contradict those of another, and what is true of many species does not always apply to another. Montgomery in reviewing the morphological data, which have accumulated rapidly of late, comes to the following conclusions: Each ovum has a prospective sex, which *may* be reversed by the entrance of the sperm. The sperm is thus a disturbing factor, sex-changing, rather than sex-producing, and probably acts by modifying the metabolism of the egg rather than by transmitting any particular sex-determinants. But what gives the ovum its prospective sex? From all this one is left with the impression that girl-babies will continue to be born, even in Asia, for many years to come.

It is the intention to establish medical boards in each divisional area of the country in connexion with the branch of the Militia Department charged with the allotment of pensions. In case of death, it is a comparatively easy matter to grant a pension as the amount is determined by the rank of the deceased and the number of those who were dependent upon him. In the case of disabled soldiers the matter is more difficult for the sum granted is then determined by the extent of the injuries received; this will be determined by the medical board.

A LEPER colony is to be established in Illinois at one of the State Hospitals for the Insane. Although there are only a few cases of leprosy in the State of Illinois, some place is needed where persons afflicted with the disease may be isolated and properly cared for instead of being thrown into jail as has happened in certain cases. The decision to establish a leper colony is due largely to the efforts of Dr. Zellar, of the Illinois State Board of Administration.

THE vigorous measures taken in Serbia against the epidemics of typhus, relapsing fever, enteric, cholera and smallpox have met with such success that these diseases are now said to be almost stamped out. The origin of the typhus and relapsing fever infections was traced to Valjevo, where the diseases broke out among the Austrian prisoners. Hospital units were sent at once from England and from America to give assistance. On February 15th, the British Army Medical Service sent out a sanitary mission under Colonel Hunter and Lieutenant-Colonel Slammers. They proceeded to Nish and at once began to disinfect the hospitals and destroy lice; wine barrels were fitted up as disinfectors and distributed through the towns and villages; inoculation against cholera was carried out, and, wherever possible, bacteriological laboratories were established and investigation made of the sources of the various epidemics. Among other units sent were the Wounded Allies' Relief Hospital, the Scottish Women's Hospital, and that sent by the Serbian Relief Fund. Apart from the wounded, there were 37,000 sick in the Army, including 15,000 cases of fever, 8,000 of which were typhus, nearly 8,000 cases of relapsing fever, and 1,500 cases of enteric. In Kragujevatz, a town of 20,000 inhabitants, there were 1,400 cases of typhus, and in three months 3,400 deaths had occurred. At Nish, on April 5th, there were 8,198 cases of typhus in hospital; on April 18th, only 948. In the same period relapsing fever had declined from 7,693 cases to 4,861, and enteric from 1,443 to 1,126.

According to a statement made by Mr. Tennant in the House of Commons on May 19th, the number of temporary commissioned officers in the Royal Army Medical Corps at that time was 3,100, irrespective of those who have recently taken commissions in the Territorial Force. Mr. Tennant also stated that nearly 6,000 medical men had been taken out of civil practice by the army. All senior medical students have been urged by the War Office to pass their final examinations as soon as possible so that they may be in a position to take temporary commissions in the R.A.M.C., and last winter a number of students who were serving in British hospitals in France were instructed to return home for their final examinations. In his address at the opening of the summer session of the General Medical Council, Sir Donald MacAlister said that enquiries at the several medical schools as to the number of students actually in attendance at the courses of medical study showed that the number was considerably over a thousand fewer than in 1913. Referring to the assistance given by the medical profession in the Dominions, Sir Donald said that Canada had been somewhat hampered owing to the fact that the registration laws of certain provinces had stood in the way of many able and efficient surgeons there resident who desired to come to the help of the Mother Country, but that the response to a communication he had addressed to the medical authorities of the provinces concerned, pointing out the imperial bearings of the question of reciprocity, had exceeded all expectations. From Ontario, British Columbia, Saskatchewan, Manitoba and Alberta, messages had been received, often by cable, stating that legislation had already been initiated for the removal of existing provincial restrictions. When the necessary steps were completed, all the provinces of Canada would have severally entered into reciprocal relations with the United Kingdom, and the way would be open for the application of the Medical Act, 1886, to the Dominion as a whole, as it is now applicable to the Commonwealth of Australia. (*British Medical Journal*, June 5th, 1915.) Reciprocal relations of course have already been established between the province of Ontario and Great Britain, and the necessary steps to this end have been taken by the province of Saskatchewan.

A JOINT committee upon the teaching of oto-laryngology in the medical course, and upon the training to be required of the specialist, has recently been appointed, to represent the American Otological Society, the American Laryngological Society, the American Medical Academy of Ophthalmology and Oto-Laryngology, the American Medical Association, and the American Laryngological, Rhinological and Otological Society. This Committee includes in its membership Dr. D. J. Gibb Wishart of Toronto, chairman; Dr. T. J. Harris, New York, secretary; Drs. Ballenger and Ingals of Chicago, Dr. Levy of Denver, Dr. Dean of Iowa City, Drs. McCuen Smith, Reber, Randall and Makuen of Philadelphia, Dr. Richards of Fall River, Dr. Chas. Richardson, Washington, and Dr. Birkett of Montreal. The Committee was organized in Chicago during the meeting of the Trilogical Society.

THE following is an additional list of contributions to the Fund for the Relief of Belgian Physicians and Pharmacists, received from members of the Montreal Medico-Chirurgical Society up to June 22nd, last: Dr. Thomas Gibson, $25.00 (Dr. Gibson also collected $172.00; the individual amounts were included in the list printed in the June issue of the JOURNAL): Dr. H. D. Hamilton, $25.00; Dr. J. A. Hutchison, $25.00; Dr. H. A. Lafleur, $25.00; Dr. C. F. Martin, $20.00; Dr. A. D. Blackader, $10.00; Dr. Marion Hansford, $10.00; Dr. E. J. C. Kennedy, $10.00; Dr. F. A. L. Lockhart, $10.00; Dr. I. C. Sharp, $10.00; Dr. J. W. Stirling, $10.00; Dr. G. G. Campbell, $5.00; Dr. A. Gould $5.00; Dr. E. S. Harding, $5.00; Dr. S. H. Martin, $5.00; Dr. H. S. Shaw, $5.00; Dr. J. W. Scane, $5.00.

Book Reviews

BLOOD-PRESSURE IN MEDICINE AND SURGERY. A GUIDE FOR STUDENTS AND PRACTITIONERS. By EDWARD H. GOODMAN, M.D., associate in medicine in the University of Pennsylvania. Philadelphia and New York: Lea and Febiger, 1914.

Much has been written about hypertension during the past ten years—many theories advanced to explain it, varied symptoms described as resulting from it, and an extensive and divergent therapy offered to combat it.

This is a book of two hundred and twenty pages well illustrated with charts, tables, and diagrams. The first two chapters are given to a review of the physiology of blood-pressure and a description of the methods devised for determining venous and capillary pressure. There is a chapter on instruments and methods for estimating arterial blood pressure; no mention is made of the Pachon Oscillometer, the instrument most used in France. Another chapter is taken up with non-pathological variations of blood-pressure. Ten pages on hypertensive cardio-vascular disease and hypotension are well worth reading.

In speaking of blood-pressure in renal conditions the author refers to Widal's classification based on the function of the kidneys. The two syndromes *chlorurémie* and *azotémie* should not be translated chloruremia and azotouremia; the French words simply mean chlorides and nitrogen in the blood. The author might in mentioning Widal's classification have included the hypertension syndrome, for Widal holds that hypertension plays a most important rôle in the symptomatology of nephritis. There is a whole group of symptoms resulting from vascular crises—numbness of the fingers, cramps in the calves of the legs, palsies and convulsions—the author should at least have referred to these. The final chapter is a review of our present knowledge concerning the effect of drugs and other therapeutic measures on blood-pressure. This book though it does not treat the subject of blood-pressure with any depth, will be found helpful to students and general practitioners.

Obituary

THE following appreciation of the late Dr. C. J. H. Chipman has been received from Dr. R. W. Powell, of Ottawa.

A familiar figure to the older generation of medical practitioners passed away at his home in Ottawa on Thursday, June 10th. Dr. Chipman was best known to McGill graduates and to those who obtained their early training in the Montreal General Hospital. Coming to Montreal in the early sixties, Dr. Chipman served his course through all its branches. His choice was McGill, where he graduated in 1868, and the Montreal General Hospital. There he was student, interne, apothecary, assistant surgeon and house surgeon, and derived inspiration from names that will go down to history in Canadian medicine, namely, Campbell, Howard, Fenwick, Drake, Reddy, Ross, Osler, and Roddick. These were the days long prior to trained nurses or antiseptics and the still greater triumphs of asepsis. To be a house surgeon in those troublous times meant more than can be explained—readiness and resource, alertness and quick wit and sound judgment, perseverance and integrity, deep reading and scientific investigation—these were all Dr. Chipman's, together with a kindly sympathetic manner and profound literary tastes. Later on, to be at work with those mentioned above—and then Shepherd, Cameron, Bell, Cline, Molson, Burland, Armstrong—names to conjure with in Montreal; to see Lister's and Pasteur's achievements exemplified at the bedside; to witness order and cleanliness brought forth from chaos: this was Dr. Chipman's portion. Still later, when in Ottawa—how shall we do him justice?—medical superintendent of the County of Carleton Hospital with Grant, Sweetland, Henderson, Church, Wright and Horsey, Powell and Cousens, Small and Jim Grant and Kidd to work with, appreciated by everybody, known to all—good deeds daily—no enemies, and a kindly nature, with literary tastes; of what need an obituary? His widow and surviving family of three sons and three daughters will be in the minds of many in Ottawa and the surrounding country in their affliction. A kindly personality and a sympathetic friend has been removed in Nature's good time. May he have the peace which passeth understanding!

DR. JOHN BLAIR GUTHRIE of Evanston, Illinois, died June 5th. Born at Guelph in September, 1868, Dr. Guthrie was educated at

Guelph and at Edinburgh, Scotland. He took his medical degree at Trinity Medical School, Toronto, in 1889 and in 1891 went into practice at Evanston. Dr. Guthrie leaves a widow, one son, and two daughters.

Dr. John Robertson McIntosh, of St. John, New Brunswick, died May 20th, in the fifty-fourth year of his age. Dr. McIntosh was born at West St. John; he attended the Grammar School there and in 1879 won the Corporation Gold Medal. In 1882 he obtained his B.A. degree from the University of New Brunswick. He then went to the University of Edinburgh where, in 1888, he obtained the degrees M.B., C.M.; two years later he received his M.D. degree. For a time Dr. McIntosh practised in Hartlepool, England; after that he spent about three years in London, paying particular attention to diseases of the eye and ear. He then returned to St. John, where he has been practising for the past twenty years. He leaves a widow and two sons.

Dr. William Wakeham, of Gaspé, died May 20th, in the seventy-first year of his age. Thirty-six years ago Dr. Wakeham was appointed by the Government fishery inspector for the Lower St. Lawrence and Gulf. The performance of duties connected with his appointment necessitated journeys to the Magdalen Islands and to remote villages along the north shore above the Labrador Coast; here Dr. Wakeham, as medical man and justice of the peace, made use of every opportunity of assisting the people and endeared himself to all. He was the representative for Canada on the Mixed Fisheries Commission. Dr. Wakeham was born at Quebec.

Dr. John E. McCuaig, of Erie, Pennsylvania, died May 18th. Dr. McCuaig was born in Oxford County, Ontario; he graduated from Queen's University in 1891. After practising for a time in Ontario, Dr. McCuaig went to the United States and was appointed to the staff of the State Insane Asylum at Danville, Pennsylvania. About twelve years ago he went into practice as a specialist in nervous diseases at Erie. He leaves a widow and three children.

Dr. P. G. Meldrum died of heart failure at Ayr, Ontario, on May 25th. Formerly in practice at Whitby, for the past few years Dr. Meldrum had been living at Toronto; and at the time of his death he was in charge of the practice of his brother, Dr. N. W.

Meldrum, at Ayr. Dr. Meldrum leaves a widow and four daughters.

Dr. James MacArthur, of London, Ontario, died suddenly from heart failure on Sunday morning, May 23rd, in the sixty-first year of his age. Born at Ailsa Craig, near London, James MacArthur, after completing his early education, entered Queen's University. After graduating in arts and medicine, he practised in London for thirty-five years, where he won both confidence and respect. Dr. MacArthur was one of the founders of the London Medical Association of which he was an active member up to the time of his death. For fifteen years he was a member of the Ontario Medical Council and a year ago became president of the Council. The duties connected with the presidency have been particularly onerous this year as a great deal of work was entailed in connexion with the establishment of reciprocal relations between Great Britain and the province of Ontario, the accomplishment of which was due largely to the efforts of Dr. MacArthur. The strain of his position, however, told upon him. His death is much regretted He is survived by two sons and three daughters.

Dr. William J. D. Sproule died at Harlem, Montana. He was a son of Mr. Newton H. Sproule, of Ottawa, and graduated from the University of Toronto in 1906.

Dr. Joseph Arthur Millette, of Megantic, Quebec, died at the St. Vincent de Paul Hospital, Sherbrooke, May 25th. Dr. Millette had been in practice at Megantic since April, 1884, and was well known throughout the district. He was born at Ste. Anne d'Yamachiche in 1860, and was a graduate of Laval University.

Dr. H. W. McGowan, of Knowlton, Quebec, died June 10th, at the age of seventy-one years. Dr. McGowan had practised in Knowlton for over twenty years.

Dr. George A. Stark died May 6th. Dr. Stark was born at Esquesing, Ontario, and was a graduate of McGill University. He practised in Milwaukee for eleven years, then went to North Dakota, where he built up a large practice in Morton County. He leaves a widow and seven children.

* Dr. J. H. Mathieson died suddenly on May 10th, 1914, in St. Mary's, Ontario, in the seventy-first year of his age. He was born in Embro, Oxford County, Ontario, where he received his early education. He subsequently attended Woodstock Grammar and the Normal School, Toronto. After teaching a few years he began to study medicine at McGill University, from which he was graduated as the "Holmes" gold medallist of his year, 1871. He immediately began to practice his profession at St. Mary's in partnership with his brother-in-law, Dr. Harrison. For thirty-one years he held a high and prominent position in medical circles. A particularly interesting case of his has been referred to by the late W. S. Playfair in his work on Obstetrics. Dr. Mathieson was a benevolent and public-spirited man and served St. Mary's for many years on the Council, Collegiate Institute and Public Library Board. He is survived by his widow and only son.

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* Received from Dr. J. R. Stanley, St. Mary's, Ontario.

Dr. Charles Masson Gordon, of Kazubazua, in the Gatineau Valley, was one of the best-known and best-loved men throughout a district stretching from Hull to the River Desert and beyond. Born in Ottawa fifty-seven years ago, his early education was received there; later he entered McGill University. After receiving his degree in medicine, Dr. Gordon practised for a time in the west, but his life's work commenced when he went to the Gatineau. Here he won affection and esteem and an enviable reputation as a practitioner and a surgeon. He leaves a widow and five daughters.

News

ONTARIO

The following is a list of candidates who have passed the final examination of the College of Physicians and Surgeons of Ontario and are now licensed to practise: Joseph William Aikenhead, Brucefield; George William Alexander Aitken, London, Ont.; William Hambly Avery, Strathroy; Daniel MacTavish Baker, Fort William; Roy Ball, Toronto; Henry Merrett Barrett, Salford; John Arthur Bean, Clinton; George Ernest Binkley, Toronto; Robert Emmet Brady, Lindsay; Charles Oscar Broad, Little

Britain; Rufus John Whitby Brooke, Georgetown; Walter William Buttle, Cobden; Walter Ruggles Campbell, Toronto; Theodore Augustus Carpenter, Port Dover; William Allen Cathcart, Courtright; Charles Cecil Cornish, Ingersoll; Waring Gerald Cosbie, Toronto; James Henry Cotton, Toronto; Eldon Douglass Coutts, Toronto; John Grant Cunningham, Moose Jaw, Sask.; William Douglas Cruikshank, Hamilton; Gordon McIntyre Dale, St. Thomas; Allan Lester Delahaye, Pembroke; John Henderson Duncan, Toronto; I. De La Matter; George Percival Dunning, Riceville; Allan Boyd Earl, Athens; Wilbert Harold Eby, Cookstown; David Haynes Fauman, Rochester, N.Y.; Gordon Ferrier, Mimico; Robert Howard Fraser, Chatham; William Paul Freeman, Lucknow; Harry Garrett Furlong, Norwich; Leonard Albert Glenn, Adelaide; Edith Hamilton Gordon, Toronto; Thomas Fleck Graham, Brantford; Freeman Reginald Guest, London; Thomas Reginald Guilfoyle, London; Dan Henry Guy, Maxwell; Charles Augustus Harris, Lakeside; Joseph Wilbert Hayes, Peterboro; Percival Hearn, Toronto; Karl Edward Hollis, Hamilton, Bermuda; William Alfred Jones, London; Thomas Francis Kelly, Orillia; Harold Ivan Kinsey, Chatham; Heikki Koljonen, Port Arthur; George A. Lamont, Guelph; Edmond Larocque, Alfred, Ont.; Frederick Levi Leacock, Easton's Corners, Ont.; Frederick Winnet Luney, London; Joseph Alexander Macdonald, Toronto; Frederick Chas. Marlow, Blackstock; Ambrose Bell Moffatt, Toronto; George Monfette, Montreal, Que.; Walter Carneil Morgan, Arden, Ont.; Henry B. Moyle, Waterford; Authur James McGanity, Hamilton; George Crerar McIntyre, Paisley; John Judson McKendry, South Mountain, Ont.; William Russell McLaren, Corunna; Gordon Archibald McLarty, Toronto; David McMullen, Petrolea; Jonathan Foote McQuay, Toronto; Edgar Harold McVicker, Toronto; Robert White Naylor, Toronto; Chas. Newell, Milton; William Robert Newman, Toronto; Frances De Sales O'Connor, Harrowsmith; Vincent Keating O'Gorman, Cobalt; Arthur Allan Parker, Toronto; Gerald Hamilton Jeffery Pearson, London; Robert Wesley Phillips, Toronto; Adelard Louis Poisson, Belle River; Andrew Rutherford Riddell, Toronto; Thomas Clarence Routley, Toronto; Norman Franklin Schram, London; Thomas Jones Scobie, Hazeldean; William Glenn Siddall, London; Thomas John Simpson, Waldemar; Emerson Charles Smith, Chesterville; Melville John Sproul, Martintown; William Berkeley Stork, Toronto; Archibald Steinberg, Berlin; Henry Archibald Stewart, Saskatoon, Sask.; Valentine Frederick Stock, Tavistock; William Andrew Vanderburg, Cayuga; Stanley Arthur

Walker, Toronto; George McKee Watt, Brantford; Charles Edgar Wilson, St. Mary's; Ivan Dolway Wilson, London; William Nathan Winkler, Toronto; Harold Alonzo Wolverton, Nelson, B.C.

Thirty-six of the above candidates have obtained commissions as lieutenants in the Army Medical Corps and will leave shortly for the front. License to practise has also been granted to the following students who are already on active service. Thus, out of 133 successful candidates, 75 have already enlisted or intend to do so.

Gerald Allison, Picton; Robert Stanley Armour, Campbellford; Stanley Stafford Ball, Hanover; Arthur McKnight Bell, Merrickville; George Beatty Burwell, Renfrew; Leeming Anderson Carr, Hamilton; Harry Arthur Cates, Toronto; John Chassels, Toronto; Frederick Walter Clement, Deseronto; Richard Colter Coatsworth, Toronto; John Thomas Courtice, Toronto; Thomas Harold Crews, Woodstock; Charles Roderick Blackburn Crompton, Brantford; James William Deadman, Beeton; Donald Thomas Fraser, York Mills; Frederick Russell Gillrie, Hamilton; Morley Edward Gorman, Oakville; Harold Parrish Hamilton, Uxbridge; Maurice Round Helliwell, Toronto; William Roy Hodge, London; John Ranson Howitt, Hamilton; William Lorne Hutton, Brantford; Edward Shapter Jeffrey, Toronto; Clifford M. Keillor, Wallacetown, Frederick Russell Kirkham, Toronto; Herbert Carl Martin, Hamilton; Robert Beattie Martin, London; Athol Alexander Moon, Cotham; Robert Whiteman McQuay, Foxwarren, Man; Paul Michael O'Sullivan, Toronto; Samuel Alexander Overend; Caledonia; Reginald Paul, Sebringville; David Emerson Scott, Spry; Harry Roy Smith, Toronto; Thomas Harold Douglas Storms, Hamilton; Hermon Brookfield van Wyck, Chatham; Stanley Young Walsh, Peterboro; David Edmund Wishart, Toronto; Harry Wishart Whytock, Madoc.

An undue number of cases of smallpox continue to appear in the province. In May 55 cases were reported. They were from sixteen different municipalities. Other infectious diseases reported were: scarlet fever, 112 cases; 3 deaths; diphtheria, 191 cases, 13 deaths; measles, 659 cases, 9 deaths; cerebrospinal meningitis, 15 cases, 9 deaths; typhoid fever, 24 cases, 6 deaths; whooping cough, 39 cases, 5 deaths; tuberculosis, 114 cases, 81 deaths.

Dr. H. W. Hill has been reappointed director of the Institute of Public Health, London. Dr. Hill resigned the directorship of the Institute about a year ago in order to accept an appointment as Executive Secretary of the Minnesota Public Health Association.

Dr. James D. Wilson, of London, has been appointed physician to the jail in succession to the late Dr. James McArthur.

The epidemic of diphtheria in Ottawa is reported to be well in hand. During the five weeks commencing May 4th, on which day Dr. Shirreff began his investigation, 57 cases were reported and two deaths occurred. During the preceding five weeks 73 cases and six deaths were reported.

MARITIME PROVINCES

The hospital trustees have decided not to enlarge the Victoria Hospital, Fredericton, until more money is available for this purpose.

MANITOBA

The infectious diseases hospital on Bannatyne Avenue, Winnipeg, has been converted into a convalescent hospital for soldiers.

Dr. E. S. Bolton, of Medicine Hat, Alberta, has been appointed medical health officer of Brandon.

SASKATCHEWAN

Measles and chicken-pox were unusually prevalent in the province during the month of May, the number of cases reported being, respectively, sixty-six and fifty-three, as compared with one case of measles and twelve cases of chicken-pox reported last year during the same month.

BRITISH COLUMBIA

Dr. R. B. White has been appointed medical health officer of Penticton in the absence of Dr. Channing-Pearce, who has left for England.

It has been proposed by Dr. L. MacMillan that a bureau should be established in Vancouver for the purpose of collecting accounts rendered by physicians. At a recent meeting of the Vancouver Medical Association the proposal was discussed and it was decided that an outline of the plan should be sent to every practitioner in the city.

Arrangements have been made whereby in the 1916-1917 provincial estimates $75,000 will be set aside as a building fund for the Vancouver General Hospital. The work of enlarging the hospital will be proceeded with at once.

The provincial government will contribute $15,000 towards the building fund of the Royal Columbian Hospital at New Westminster. The sum necessary to complete the construction of the hospital is about $27,000 and the city of New Westminster will provide the balance, namely, about $12,000.

MEDICAL COLLEGES

McGill University

The honorary degree of LL.D. has been conferred by the University upon His Majesty the King of the Belgians, "as a slight expression of the great admiration felt throughout Canada for the heroic courage and devotion with which he has led the people of Belgium in their resistance to an altogether unjustifiable, but evidently long premeditated attack on the integrity and independence of their country."

The following appointments have been made in the faculty of medicine: Associate professor of pathology, Dr. Horst Oertel; assistant professor of chemistry, Dr. B. H. Krieble; lecturer in physiology, Dr. T. P. Shaw; lecturers in immunology, Dr. J. C. Meakins and Dr. Fraser B. Gurd; lecturer in hygiene, Dr. R. St. J. McDonald; lecturer in biology, Dr. F. S. Jackson; lecturer in general chemistry, A. R. MacLean.

Toronto University

The following is the list of those who recently graduated in medicine: William Harold Trevorrow Baillie, M.A., Toronto; John Arthur Bean, B.A. (Manitoba), Clinton, Ont.; Norman Edwin Betzner, B.A., Copetown, Ont.; Walter Ruggles Campbell, M.A., Toronto; James Henry Cotton, M.A., Toronto; Harold Dickson Courtenay, B.A., Ottawa; Eldon Douglas Coutts, B.A., Toronto; John Grant Cunningham, B.A., Moose Jaw, Sask.; Gordon McIntyre Dale, B.A., St. Thomas, Ont.; Joseph Daly, B.A. (Oxon.), Iona, P.E.I.; John Henderson Duncan, M.A., Toronto; Robert Howard Fraser, B.A., Chatham, Ont.; Edith Hamilton Gordon, B.A., Toronto; William Thomson Kennedy, M.A., Toronto; David Easton Lang, B.A., Toronto; Ambrose Bell Moffat, B.A., Toronto; Vincent Keating O'Gorman, B.A. (Ottawa), Cobalt, Ont.; Andrew Rutherford Riddell, B.A., Toronto; Valentine Frederick Stock, B.A., Tavistock, Ont.; Roy Ball, Toronto; John David Henry White Barnett, St. Mary's, Ont.; Howard Black, Stroud, Ont.; Roy Armstrong Bond, Toronto; John Reginald Boyd, Meaford, Ont.; Charles Oscar Broad, Little Britain, Ont.; Walter William Buttle, Cobden, Ont.; Wyman Alexander Cameron, Advocate, N.S.; Theodore Augustus Carpenter, Port Dover, Ont.; William Allen Cathcart, Courtright, Ont.; Bessie Lawrence Collver, Waterford, Ont.; Warring Gerald Cosbie, Toronto; William Laurance Evans, Regina, Sask.; Leslie Clinton Fallis, Toronto; David Haymes Fauman, Rochester, N.Y.; Gordon John Ferrier, Mimico, Ont.; Thomas Edmund Peachey Gocher, Seattle, Wash.; Dan Henry Guy, Maxwell, Ont.; William Carroll Haney, Toronto; Robert Inkerman Harris, Toronto; Joseph Wilbert Hayes, Peterborough; Percival Hearn, Toronto; Arthur Belton Holmes, Toronto; Harold Ivan Kinsey, Chatham, Ont.; George Anderson Lamont, Guelph; Frank Lawrence Letts, Bridesville, B.C.; Albert George Ley, Markham, Ont.; George Chesterfield Livingstone, Toronto; Leycester Bancroft Lyon, St. Ann's Bay, Jamaica; Arthur James McGanity, Hamilton; George Crarer McIntyre, Paisley, Ont.; William Russell McLaren, Sarnia, Ont.; Gordon Archibald McLarty, Toronto; David McMullen, Petrolea, Ont.; George Walter MacNeil, Owen Sound; Jonathan Foot McQuay, Toronto; Edgar Harold McVicker, Toronto; Frederick Charles Marlow, Nestleton Station, Ont.; Harry Knight Mitchell, Port Arthur, Ont.; Robert White Naylor, Toronto; Charles Newell, Milton, Ont.; William Robert Newman, Toronto; Thomas Clarence Routley, Toronto; Thomas John Simpson, Waldemar, Ont.; Hildegarde May Smith, Bombay, India; William Berkeley Stark, Toronto; Vernon Harcourt Storey, Port Hope, Ont.; Frederick Henry Sutherland, Toronto; Stanley Arthur Walker, Toronto; George McKee Watt, Brantford, Ont.; Charles Edgar Wilson, St. Mary's, Ont.; William Nathan Winkler, Toronto.

No medals or scholarships were awarded in the faculty of medicine this year.

Professor Irving H. Cameron, who has occupied the Chair of Surgery at the University of Toronto since the year 1887, has been appointed honorary visiting surgeon on the staff of the King George Hospital, London.

Queen's University

No. 5 Stationary Hospital, which left for England a few weeks ago, under the command of Lieutenant-Colonel Etherington, is to be increased from 200 to 400 beds. The personnel also will be increased by the addition of four officers, four sergeants and thirty two rank and file.

Laval University

The medical faculty of the University recently offered a military hospital of 520 beds for service overseas. The offer was accepted by the Militia Department on condition that the unit should be increased to a hospital of 1,040 beds. The University, however, has found it impossible to renew its offer for the present.

The following candidates have graduated in medicine from Laval University, Quebec. Last year there were no graduates, as the medical course was then lengthened from four to five years. E. Perron, St. Charles; R. Beaudry, St. Raphael; J. M. Beaulieu, Sayabec; A. Desrosiers, Ste. Luce; J. A. Couture, Levis; J. B. Lacroix, St. Charles; L. Lizotte, Ste. Anne de la Pocatière; H. McCaffrey, Nicolet; J. A. Lafleur, St. Jean Deschaillons; R. Neilson, Quebec; M. Lavoie, Ste. Marie de Beauce; A. Tousignant, Ste. Sophie de Lévrard.

Alberta University

The following physicians have been granted license by the University to practise medicine in the Province of Alberta: Dr. W. E. Fraser, Bashaw, Alberta; Dr. John Nay, Winnipeg; Dr. D. R. Wark, Mather, Manitoba; Dr. W. W. Inkrote, Diamond City, Alberta; Dr. E. A. Ferguson, Czar, Alberta. Supplementals have been granted to Dr. S. Astrof, Edmonton, in surgery; to Dr. J. E. Mason, Delia, Alberta, in anatomy and medicine; to Dr. E. F. Nivin, Jasper, Alberta, in anatomy.

Western University

The annual convocation was held on May 28th, last, when the degree of M.D. was conferred by Principal Braithwaite upon George D. McTaggart, Gerald H. J. Pearson, Emmerson C. McFarlane and William M. Siddall. Degrees (in absentia) were also conferred upon Herbert R. Baines, Louis D. Chapman, Rupert G.

Doupe, M. Keillor, Irving J. Leatherdale, Wilfrid John Laurie, Beatie Martin, and David E. Scott. Drs. Laurie, Martin and Scott are serving in base hospitals at the front. The course in medicine at Western University also has been lengthened from four to five years and this is the last time that degrees will be given after four years of study. Dean McCallum announced that a campaign is to be undertaken this summer for funds to build a new medical building.

ARMY MEDICAL SERVICES

In a letter dated June 19th, just received from Captain James C. Fyshe, C.A.M.C., No. 1 Field Ambulance, First Canadian Divison, B.E.F., France, he states that during an action, when the wounded are coming in by the hundred, and the bustle, confusion, and dirt are at their height, and where there is no time to make up hypodermic solutions, the practice of administering morphine by placing a tablet beneath the tongue has not proved satisfactory, and that the use of "hypodermic units," each containing $\frac{1}{4}$ grain morphine and $\frac{1}{150}$ grain atropine, has given great satisfaction. It is likely that, with the approval of the Militia Department, an appeal will shortly be made for the necessary funds to defray the cost of supplying these "hypodermic units" to Regimental Aid Posts and Field Ambulances for use in emergency cases.

A clearing hospital has been established at Valcartier to receive wounded soldiers on their arrival from England. The patients will be examined and, if necessary, retained in the hospital until they are well enough to be moved to convalescent homes, or to their own homes.

Lieutenant A. L. McQuarrie has been appointed permanent member of the New Westminster Army Medical Examining Board in succession to Lieutenant J. W. Woodley.

No. 2. Clearing Hospital and No. 3 Stationary Hospital are stationed at Shorncliffe at the hospital which has been established there instead of the one at Bulford. Each unit remains under its commander, Colonel Rennie and Lieutenant-Colonel Casgrain respectively, but the hospital is under the command of Lieutenant-Colonel Wallace A. Scott. The patients in the various hospitals on Salisbury Plain have been removed to the Shorncliffe Hospital.

Dr. R. J. Manion, of Fort William, who has been serving on the surgical staff of an Anglo-French hospital established in the Chateau de Rimberlieu, near Compeigne, France, has returned to Canada but expects to leave again for the front very shortly.

Dr. J. G. McLeod, of Kincardine, Ontario, has joined the staff of one of the Red Cross hospitals in England.

Dr. A. D. W. Kay, of Fort William, has joined the French Army Medical Corps.

The following doctors who received their medical degrees from the University of Toronto before leaving with No. 2 Casualty Clearing Hospital, have been gazetted lieutenants in the Royal Army Medical Corps: Drs. Gerald Allison, Stanley S. Ball, Arthur M. Bell, Leeming Carr, Harry A. Cotes, John Chassels, Frederick W. Clement, Richard Collier Coatsworth, Thomas Harold Crews, Donald Thomas Fraser, Harold Parrish Hamilton, Maurice R. Helliwell, William Ray Hodge, H. Carl Martin, Athol A. Noon, Paul M. P. Sullivan, Harry R. Smith, Thos. Harold Storms, Stanley Young Walsh, and D. E. Staunton Wishart. Commissions in the R.A.M.C. have been granted to Drs. E. B. Lang, R. E. Johnston, and F. Brodie, of Vancouver; Drs. J. S. Chisholm and W. P. MacKasey, of Kalifax; Dr. H. M. Godfrey, of Marshfield, Prince Edward Island; Dr. S. R. Johnston, of Dartmouth, Nova Scotia; Dr. J. G. F. Heal, of Guysboro', Nova Scotia; Dr. H. S. Moore, of Kentville, Nova Scotia; Drs. Nathaniel Macdonald and W. W. Patton, of Cape Breton; Dr. G. W. Whitman, of Stellarton; Dr. Arthur Maxwell Fisher, of St. John, New Brunswick; Drs. Thos. F. Cotton, Fraser Gurd, W. S. C. Gowdey, A. M. Fisher, W. J. Grant, and R. R. Scott, of Montreal; Dr. A. J. Lomas, of Longueuil, Que.; Dr. Ronald R. Scott, superintendent of the Western Hospital, Montreal; Dr. L. D. MacIntosh, of Hartland, New Brunswick; Dr. G. A. Ramsay, F. H. Bowen, J. Thornley Bowman, of London, Ontario; Dr. W. J. Hicks, of Wilkesport, Ontario; Dr. W. G. Laird, of Southampton, Ontario; Dr. C. R. Totten, of Windsor, Ontario; Dr. G. C. Bell, of Merlin, Ontario; Dr. G. C. Brink, of Port Stanley, Ontario; and Dr. T. P. Bradley, of Sarnia, Ontario; Drs. W. G. Cosbie, E. D. Coutts, J. H. Duncan, P. Hearn, A. B. Moffatt, G. A. McLarty, E. H. McVicar, R. W. Naylor, W. R. Newman, A. R. Riddell, T. C. Routley, W. B. Stark, S. A. Walker, and W. N. Winkler, of Toronto; Dr. W. W. Buttle, of Cobden, Ontario; Dr. W. A. Cathcart, of Courtright, Ontario; Dr. G. I. Dale, of St. Thomas, Ontario; Dr. G. Ferrier, of Mimico, Ontario; Drs. R. H. Fraser and H. I. Kinsey, of Chatham, Ontario; Drs. T. F. Graham and G. McKee Watt, of Brantford; Dr. C. A. Harris, of Lakeside, Ontario; Dr. J. W. Hayes, of Peterborough; Dr. G. A. Lamont, of Guelph; Dr. F. C. Marlow, of Blackstock, Ontario; Dr. A. J. McGanity, of Hamilton; Dr. G. C. McIntyre, of Paisley, Ontario; Dr. W. R. McLaren, of Corunna, Ontario; Dr. D. McMullen, of Petrolea, Ontario; Dr. C. Newell, of Milton, Ontario; Dr. V. K. O'Gorman, of Cobalt, Ontario; Dr. T. J. Simpson, of Waldemar, Ontario; Dr. C. E. Wilson, of St. Mary's, Ontario; Dr. C. O. Broad, of Little Britain, Ontario; Dr. J. G. Cunningham, of Moose Jaw, Saskatchewan; Dr. Melville Krolik, of Montreal; Dr. E. Vincent Sullivan, of St. Stephen, New Brunswick; Dr. Harry Lawson, of Rolling Dam, New Brunswick; Dr. H. J. Thomas, of Montreal; Drs. D. L. B. Wilmot and A. R. Thomas, of Winnipeg; Dr. J. C. Morris and T. J. Costello, of Calgary; and Dr. Henri Lasnier, of Montreal.

DR. A. A. MACKAY, of Montreal, has left for the front as medical officer to the 42nd Highlanders.

MAJOR H. S. MUCKLESTON, of Montreal, has been appointed sanitary officer at Valcartier, where part of the third and fourth contingents are now in training. The medical officer is Major G. A. Winters, A.M.C.

DR. YOUNG, of Ottawa, and Dr. A. A. Wilson, of Ladner, B.C., have left for the front.

DR. HAROLD WILLIAMSON, A.M.C., of Port Arthur, has been gazetted Captain and will leave for the front with the field ambulance corps mobilized at Fort William.

DR. J. E. MCASKELL, who for the past year has been resident physician at the Vancouver General Hospital, has left for France.

CAPTAIN D. SMITH, A.M.C., of Stratford, Ontario, has been placed in charge of the field hospital of the 33rd and 34th battalions at the London concentration camp. Captain Smith will be in command of one section of the field ambulance which is to be mobilized in four sections.

After serving for some time with the Royal Army Medical Corps at Bethune, Dr. Streight, of Welland, Ontario, accepted a position on the staff of one of the London hospitals. He has now returned to the front.

Dr. M. J. Vigneux, of Nelson, British Columbia, and Dr. Stammers of Smiths Falls, Ontario, have joined the Army Medical Corps.

The following officers have joined the staff of the Canadian hospital at Le Touquet: Captain Jeffrey, Toronto; Captain McLean, Nova Scotia; Captain O'Hagan, Calgary; Captain Smith, Moose Jaw; Captain Flagg, Ottawa; Captain Dean, Winnipeg; Captain Panton, Vancouver; and Captain McEwen, Saskatoon.

Lieutenant-Colonel Harwood, of Edmonton, commanding officer of the 51st battalion, has left for the front. Captain Gunn accompanied the battalion as surgeon. Major Harris accompanied the 49th battalion in the capacity of surgeon.

Lieutenant J. J. Gillespie, A.M.C., of Pincher Creek, Alberta, is medical officer to the 13th Mounted Rifles.

The following is the personnel of "A" Sanitary Section, A.M.C., which has been recruited at Montreal and expects to leave very shortly for England, where it will form a branch of the R.A.M.C. Officer in command: Major T. A. Starkey, of McGill University; Staff-Sergt. F. G. M. Williams, Corp. W. A. Brooks, Corp. R. W. Maynard, Lance-Corp. P. F. Seymour, Pte. D. Blunn, Pte. L. L. Brown, Pte. L. R. Bauset, Pte. W. B. Campbell, Pte. N. I. Chipman, Pte. B. Cooke, Pte. R. P. Cromarty, Pte. J. Dick, Pte. J. Duncan, Pte. K. H. S. Hague, Pte. E. W. Haines, Pte. W. G. Hardy, Pte. S. W. Harper, Pte. F. C. Hembling, Pte. R. W. Heward, Pte. J. A. Labelle, Pte. R. S. O'Meara, Pte. A. E. Pearce.

Captain J. H. Hamilton, of Revelstoke, British Columbia, has been appointed medical officer of the 54th Battalion, now in camp at Vernon.

The Vancouver military hospital will be known as No. 6 Canadian General Hospital and will be in command of Major E. C. Hart, chief of medical services in the province of British Columbia.

The personnel of the unit will consist of thirty-two medical officers, one dental surgeon, two quartermasters, two warrant officers, twenty-one sergeants and staff-sergeants, two buglers, two hundred and one rank and file, and seventy-three nursing sisters. About one-half of the personnel will be recruited in Vancouver. Among those who have volunteered to accompany the hospital are : Major F. C. McTavish, A.M.C., who served in the South African War and who took a prominent part in the organization of the eighteenth company of the field ambulance and commanded the section for several years. Major McTavish also took a prominent part in the organization of the St. John's Ambulance branches in the province of British Columbia. Dr. A. P. Proctor, chief surgeon of the Canadian Pacific Railway medical service; Dr. A. S. Monro, director of the Vancouver General Hospital; Dr. F. P. Patterson, Dr. J. W. McIntosh, Dr. A. B. Schinbein, Dr. C. S. McKee, Dr. J. S. Hogle, Dr. A. Rocke Robertson, and Dr. G. B. Murphy.

Drs. W. A. Clarke and Wallace Wilson, of Vancouver, have joined the A.M.C.

A hospital of 250 beds has been established at the Sewell camp, Manitoba.

A hospital of fifty beds has been opened at Three Rivers, Quebec, in connexion with the Montenegrin Reservists' Camp.

It is announced that No. 3 Canadian General Hospital (McGill) has arrived in France and is stationed at Camiers, the Boulogne base.

Dr. C. E. Bourne, medical superintendent of the Montreal General Hospital, has gone to Three Rivers, Quebec, where he has been appointed sanitary inspector of the camp. He is succeeded by Dr. E. T. Kirkland as medical superintendent of the hospital. Drs. E. Waterson and A. T. Bazin, of Montreal, have left for Valcartier.

Captain W. G. Cosbie, A.M.C., of Toronto, is attached to the 58th Battalion as medical officer.

Drs. F. W. Manning and Charles R. Totten, of Windsor, Ontario, have been appointed to the staffs of hospitals in France.

The following members of the Army Medical Corps were mentioned by Field Marshal Sir John French for distinguished conduct in the field and their names appear in a supplementary list of King's birthday honours:

Temporary Colonel Gilbert Lafayette Foster, C.B.
Lieutenant-Colonel Frederick Sampson Lampson Ford, C.M.G.
Temporary Major H. A. Chisholm, D.S.O.
Captain T. H. McKillip, D.S.O.
Captain A. E. Haywood, awarded Military Cross.

Distinguished conduct medals have been awarded to Sergeant Brown, Sergeant-Major Clifton, and Private Turner.

The decoration of the Royal Red Cross is awarded to Matron E. Campbell.

Others mentioned by Field Marshal Sir John French are: Lieutenant-Colonels McPherson, Ross, Shillington, and Watt; Majors Duval and Hardy; Captains Bell, Brown, Donaldson, Fraser, McGibbon, McQueen and Stone; Quartermaster-sergeant Cooke; Staff-Sergeants Butt, Milborne, and Rotsey; Sergeants Brown, McKay (dead), and Smith; Corporal McDonald; Privates Bartley, Chester, Dalton, Farr, Holloway, Head, Lisney, Leishman, Millen, Stewart, Tompkins, Trottier, and Youldon; and Sister Richardson, of the Nursing Service.

The Victoria Cross has been awarded to Captain F. A. C. Scrimger. Captain Scrimger, who is the son of Rev. John Scrimger, of Montreal, went to the front with the Fourteen Battalion. He is the first Canadian soldier to receive the Victoria Cross.

The following have been transferred from No. 3 General Hospital (McGill) and have been given temporary commissions in the R.A.M.C.: Lieutenants G. F. Laing, of Windsor, Ont.; H. F. H. Eberts, of Victoria, B.C.; C. D. Kean, of Brockfield, Bonavista Bay, Nfld.; Otto Demuth, of Penticton, B.C.; P. B. Belanger, of Ottawa; L. H. Leeson, of Vancouver; H. F. MacNaughton, of Hopewell Cape, N.B.; A. D. Sharpe, of Summerside, P.E.I.; I. D. Ramsay, B.A., of Waskade, Man.; Wm. Templemon, of St. John's, Nfld.; D. Lee Smith, of Vancouver; F. S. Walcott, of St. James, Barbadoes, B.W.I.; C. O. Walsh, of Canso, N.S.; and H. C. Wert, of Avonmore, Ont.

Dr. Osborne, of Hamilton, has been placed in charge of the eye and ear department of the Duchess of Connaught Red Cross Hospital at Cliveden.

TEMPORARY lieutenancies in the R.A.M.C. have been granted to the following who enlisted in the Canadian Army Medical Corps as non-commissioned officers or privates: Staff-Sergeants W. Deadman, S. Overend, D. A. Fletcher, G. M. Shaw, C. L. Arthur; Sergeant-Majors C. Brisco, W. Brown, Sergeants L. Carf, F. Overholt, J. Ryan; Corporals J. Williams, G. Burwill, E. Ward; Lance-Corporal J. Courtice; Privates J. Chassells, H. Oates, H. Murray, C. MacLean, H. Sharman, W. Pedlow, M. Van Duven, E. De Beaupré, F. Diamond, D. MacFarlane, H. McKenzie, K. Millan, J. Stewart, N. Glaoe, G. Cronk, J. Fisher, W. Clark, J. Box, A. Howson, K. MacKinnon and H. Jarman.

LIEUTENANT FRASER B. GURD, A.M.C., of Montreal, has been gazetted second lieutenant R.A.M.C.

CAPTAIN WILLIAM M. HART, C.A.M.C., of Regina, who was taken prisoner has been exchanged and has arrived in London. A tribute to Dr. Hart's bravery is paid by Mr. W. M. Scanlon, of Regina, who writes that in the middle of the terrible battle of Langemarck, Dr. Hart, scorning flying bullets and shrapnel, hurried to the assistance of wounded men in the face of almost certain death.

THE War Office has accepted the offer of the medical men of Vancouver to supply the personnel and entire equipment of a base hospital of one thousand beds. The offer made by the Saskatchewan College of Physicians and Surgeons has also been accepted. The unit supplied will take the form of a stationary hospital of two hundred beds with a staff of ten physicians, seventy assistants, one matron, ten nursing sisters, and sixteen staff nurses. It is estimated that the cost will be about $35,000.

CAPTAIN W. B. MACDERMOTT, A.M.C., of Lang, Saskatchewan, has been transferred from the 46th Battalion at Calgary to the First Canadian Mounted Rifles from Brandon.

CAPTAIN HAROLD B. BOYD, A.M.C., of Ridgway, Ontario, who was wounded while serving with the field dressing station attached to the fourteenth battalion, is home on sick leave.

Medical Societies

ONTARIO MEDICAL ASSOCIATION

The thirty-fifth annual meeting of the Ontario Medical Association was held in Peterborough May 25th to May 28th, 1915, in conjunction with the annual meeting of the Medical Officers of Health. On Tuesday, May 25th, the fourth annual conference of the Medical Officers of Health of the province of Ontario was opened under the presidency of Dr. W. R. Hall, of Chatham. The attendance was good, about 280 members being present. At the morning and afternoon sessions several interesting papers were read, and in the evening the Mayor of Peterborough gave an address of welcome. The question of salaries for medical officers of health was discussed at the afternoon session on Wednesday and a committee appointed to consider the matter suggested the following schedule: townships, $300 per annum; incorporated villages up to 1,000 population, $150 per annum, with addition of $50 for each additional 1,000 population or majority thereof; towns, $100 for first 1000 population with the addition of $50 for each subsequent 1,000 population; cities under 20,000 population $1,000 per annum; cities of larger population $1,200 per annum. This schedule was adopted. It was pointed out that, in the case of towns and cities, the remuneration given should be sufficient to enable the medical officer to devote his whole time to the duties entailed by his position as medical officer of health. The election of officers resulted as follows: president, Dr. A. W. McPherson, of Peterborough, who is now on active service; vice-president, Dr. A. J. Macauley, of Brockville; secretary-treasurer, Dr. J. W. S. McCullough, of Toronto; committee on papers, Dr. Roberts, of Guelph, Dr. F. A. Dales, of Stouffville, and Dr. J. W. S. McCullough, of Toronto.

On Wednesday afternoon, a business meeting of the Ontario Medical Association took place, the president, Dr. D. J. Gibb Wishart, in the chair.

After the reading of the minutes, the following were elected to the nominating committee: Drs. H. J. Hamilton, J. H. Elliott, W. A. Young, A. Moorehead, F. C. Harrison, J. Loudon, N. D. Buchannan, H. B. Anderson, and W. H. B. Aikins. The following reports were then received and adopted: The Treasurer's, by J. H. Elliott; Audit by J. M. McColloch and E. A. Hammond; Credentials by

W. K. Colbeck; Papers and Business by H. J. Hamilton. At 4 p.m. the City of Peterborough and the local profession entertained the Association by an excursion over the Lift Locks, afterwards serving refreshments in the Armouries. The evening session met in the Collegiate Institute. The programme consisted of the President's address (see page 469 of the JOURNAL) and a paper on the clinical manifestations of syphilis, by Dr. J. G. Phillips, of Cleveland.

Thursday morning was taken up with the meetings of the sections in Medicine, Surgery, Obstetrics and Gynæcology, and Ear, Eye, Nose and Throat. In the afternoon, Professor F. J. Shepherd of Montreal delivered the address in Surgery; Dr. A. H. Wright gave a paper on Medical Education and Fee-Splitting, and Dr. A. F. McKenzie one on the local Medical Society. In the business meeting which followed, the Secretary read a report of the committee on the affiliation of the County Medical Societies which recommended the following:

1. "That a member should belong to a local Society before becoming a member of the Ontario Medical Association, special provision being made for admission for members living in districts not yet organized.

2. "Membership in a local Society makes a member eligible for the Ontario Medical Association and his fee may be collected through the local Society.

3. "It shall be the duty of this committee to obtain the volunteer services of members of the Association to aid the organization of societies."

Dr. H. J. Hamilton presented the report of the Committee on the relations of the Ontario Medical Association and the Canadian Medical Association, reporting progress and asking leave to sit again. After some discussion these reports were adopted.

Resolutions:

Moved by Dr. Bruce, seconded by Dr. H. J. Hamilton, that the Association have a paid organizer for the coming year. Carried.

Moved by Dr. C. Myers, seconded by Dr. Hamilton, "That this Association desires to place itself on record in favour of active steps being taken immediately for the prevention of insanity by the establishment of separate neurological wards in general hospitals, especially in those hospitals in which clinical teaching is given." Carried.

The Nominating Committee then presented its report:

Place of meeting, Toronto; President, Dr. H. B. Anderson; vice-presidents, Drs. G. S. Cameron, Peterborough; A. T. Emmerson, Goderich, C. B. Oliver, Fort William; W. K. Colbeck, Welland; general secretary, Dr. F. Arnold Clarkson; assistant secretary, Dr. F. C. Harrison; treasurer, Dr. J. H. Elliott; delegates to the Canadian Medical Association, Drs. D. J. Gibb Wishart, F. C. Neal, and H. J. Hamilton.

Moved by Dr. J. H. Elliott, seconded by Dr. W. A. Young, that the usual honorarium be paid the secretaries. Carried.

Moved by Dr. Elliott, seconded by Dr. F. N. G. Starr, "That we, the members of the Ontario Medical Association, assembled in anuual meeting wish to express our deep appreciation of the loyalty and self-sacrifice of our fellow members of the profession who have offered themselves and are now serving the Empire and its allies at the front in the various services. In thus serving the cause of freedom, many will come back under conditions which will practically mean beginning their professional life over again. As fellow practitioners, we wish to assure them that as far as lies in our power, we will see that their old clientèle awaits them on their return to civil practice, and that their relations to former patients will as far as possible be restored. For the fulfilment of their arduous duties, we wish them health and strength, and we express our sincere hopes of a speedy and safe return to their homes and families." Carried.

The following resolution was passed unanimously by the section of Obstetrics and Gynæcology: "That the general session appoint a committee to consider and enforce adequate measures for a campaign amongst the members of the medical profession and the public to guard against the ravages of cancer, by early diagnosis and treatment; and to report at the next meeting of the Ontario Medical Association." Carried.

Moved by Dr. Colbeck, seconded by Dr. N. D. Buchanan, "Be it resolved that this Association deplores the fact that very inadequate provision has been made for the payment of medical and hospital fees of workmen injured in the industrial concerns of the province. While some manufacturers, in addition to their contribution to the funds of the Compensation Board, have made ample provision, many others have done nothing whatever. We would ask that the Compensation Board take steps in co-operation with the Government, to have amendments made to the Workingman's Compensation Act, so that workmen, who received only half pay while incapacitated, will not be under the necessity as at present, of paying these charges out of their already too-scanty earnings." Carried.

Moved by Dr. A. A. McDonald, seconded by Dr. H. B. Anderson, that a hearty vote of thanks be tendered to the Mayor and Council of the City of Peterboro, and to the Ladies' Committee, for their great kindness and hospitality to the members of this Association, and that a copy of this resolution be sent to the Mayor. Carried.

The new officers were then installed.

The evening session was held in the Collegiate Institute.

On Friday morning sectional meetings were held in the Armouries. The total registration was 176.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The ninth regular meeting of the Society was held Friday February 5th, 1915, the President, Dr. W. F. Hamilton, in the Chair.

PATHOLOGICAL SPECIMENS: Series by Horst Oertel, M.D.

1. *Large liver abscess of obscure origin and etiology.* The patient, a man thirty years of age, entered the Royal Victoria Hospital apparently suffering from an acute infectious disease, which originally was diagnosed as probable typhoid fever. This, however, was soon questioned. He presented more or less indefinite abdominal symptoms and, at first slight, and later more accentuated, pulmonary symptoms, pointing to the presence of fluid in both chests and rather indefinitely to cavitation. The Widal reaction was negative, white blood cell count 17,600, temperature varied from 98° to 104·2° with a pulse of from 76 to 140. Urine concentrated with a slight amount of albumen, no casts. The disease ran in a general way the course of a septicæmia.

Autopsy disclosed double exudative fibrinous pleurisy, both lungs floating in a large amount of turbid fluid. The lungs showed multiple abscesses. The right lung contained four or five intercommunicating small abscesses in the middle lobe, with similar ones in the lower and upper part of the upper lobe. Some were also in the lower lobe near the base. There existed a certain amount of purulent infiltration of the lung tissue immediately surrounding these abscesses. The left lung showed only one or two small abscesses in its upper lobe. There was nowhere extensive pneumonic consolidation, save that limited purulent infiltration of lung tissue surrounding the just-mentioned intercommunicating, apparently metastatic, abscesses.

Searching for other foci, attention was immediately directed to the tremendously enlarged liver, which had pushed the dome of the diaphragm on the right side upward, although the liver itself was quite free from it and not adherent. On the left side, the liver had been pushed by this enlargement of the right lobe upward and backward, so as to reach the dome of the diaphragm on the left side and resting against the spine. However, it was everywhere free from adhesions. The structures of the portal spaces were free, portal glands not prominent. The portal vein and the vena cava inferior contained fluid blood and were otherwise unchanged. The enlargement of the liver was almost entirely at the expense of the right lobe, the upper part of which was extremely bulging and on percussion fluctuated. This enlargement of the right lobe was responsible for the displacement of the rest of the liver substance to the left, upward and backward. The weight on removal was 4,075 gm. On section a tremendous amount of creamy, greenish, but non-odorous pus escaped from the upper part of the right lobe and it was found that the largest part of the upper lobe, leaving only about 7 cm. of the right lower lobe, was transformed into intercommunicating abscess cavities. The whole of the right lobe of the liver measured, after removal of the pus, 25 × 17 cm. The left lobe to the interlobar notch measured 10 × 15 cm. The left lobe was flat and apparently quite uninvolved. A further examination of the iliac veins and the inferior vena cava, as well as the carotid arteries and the aorta, showed these vessels only filled by fluid blood. The mesenteric glands were not prominent. The stomach, duodenum, gall-bladder and ducts were free. Nothing of any further importance was discovered at autopsy and section had been limited to abdomen and thorax, so that other structures in this regard important, as, for instance, the middle ear, could not be examined. Under the circumstances, it is not easy to trace the origin of the lesion and determine its etiological factor.

In the first place, the bacteriological examinations, kindly made by Dr. Bruère and Dr. Mason, were interesting, but not conclusive. During life, the pleural fluid was found sterile and non-pathogenic to mice and guinea pigs. At autopsy, some of the pus from the liver abscess and some from the lung was examined with the following results: In the lung were predominatingly hæmolytic and non-hæmolytic streptococci, two diphtheroid bacilli, a few definite pneumococci and organisms of very similar morphology to those which were practically pure in the liver abscess. These latter were gram-positive diplococci growing in staphylocoid masses. They were not capsulated and were impossible to cultivate ærobically and anærobically on media containing blood serum. This organism was found non-pathogenic for mice and guinea pigs. The bacteriological examination, therefore, leaves the etiology rather misty.

Tracing now the origin, it appears from examination of the liver, particularly where the lesion is still more recent, that the extension within the liver corresponds to what is usually characteristic of a portal infection. As is well known, infections of the liver may enter through the bile ducts, the lymphatics, both of which could be easily ruled out in this case, or the vascular system. Of these ports of infection, the venous system is, of course, the most important. This may be concerned either through the portal system or by retrograde infection through the hepatic veins. It was, as will have been seen, perfectly impossible to trace any portal infection in this case. There existed no ulceration in the gut, mesenteric arteries and veins were perfectly intact and, as previously recorded, all the structures of the portal spaces were free. The question arises, therefore, whether it is possible in this instance to deal with an arterial infection or one through the medium of the hepatic veins. Now, infection through the hepatic artery rarely produces extensive large abscesses in the liver. It is most frequently encountered in septic endocarditis and then usually produces small miliary abscesses, but this does not correspond at all to what we have here before us. There remains, then, the possibility of infection through the hepatic veins by retrograde embolic metastases from a distant focus. In middle ear disease it is, for instance, possible that bacterial emboli may reach the jugular vein, the superior vena cava, the right auricle; travel backward through the inferior vena cava to the hepatic veins, thence to the liver, where they primarily form small embolic abscesses. But these, in breaking down, may involve, and then extend within, the portal system of the liver, thus gradually simulating a true portal infection. In other words, the picture of a portal infection in the liver may result from a general bacteriæmia, and I am inclined to believe that this is what occurred in this case, although original focus and port of entrance remain obscure. As to the direct etiological factor, we are, of course, unable to make any statement with any definiteness, but there is some foundation,—not much, but some,—that the case belongs to the category of pneumococcic pyæmias. What bacteriological evidence we possess, further the character of the pus, and, finally, past experience are in its favour. It is certainly most peculiar and interesting that this diplococcus stained exceedingly well but resisted all attempts at cultivation and had lost all its pathogenic power. If it, therefore, belongs to the group of pneumococci, or, indeed, under any circumstances, it is certainly a very attenuated organism which must have lost its pathogenic property in the development of the disease.

2. *Carcinoma of cervix extending to parametrium.* This second specimen is an extensive carcinoma of the cervix, inoperable at the time of admission to the Royal Victoria Hospital, which illustrates exceedingly well the progress of this disease. The specimen shows the cervix absolutely destroyed, necrotic, in process of cavitation; but one also sees that growth and ulceration stop abruptly at the body of the uterus. The disease does not extend upward beyond the cervix, but sideways into the right parametrium, producing a similar extensive ulcerative growth. Within the parametrium it has travelled upward so as to involve the right ovary and right tube, leaving the body of the uterus intact. Thus the progress of this carcinoma is not one by continuity or even contiguity, but by preference typical of lymphatic extension. The case was complicated by involvement of the ureters, leading to their dilatation and an early hydronephrosis.

3. *Complete tuberculosis of both supra-renal glands, communicating with vein on left side, miliary tuberculosis, no Addison's disease.* In a case of miliary tuberculosis of both lungs, complicated by tuberculous meningitis, was found a very advanced cheesy tuberculosis of both supra-renals. In the left super-renal practically no normal tissue remained. Sections of what might grossly still be regarded as a remnant of supra-renal tissue in the upper pole, show even this transformed into tuberculous cheesy masses. A larger vein is found to communicate directly with the cheesy masses in the centre of the gland, so that, undoubtedly, a ready access was established to the rest of the circulation. The right supra-renal was not quite so diffusely affected, but nodular masses also permeate it very generally. This case is not only interesting as illustrating a rare origin of the miliary tuberculosis, but because symptoms and signs of Addison's disease were lacking entirely. In this connexion, however, one anatomical peculiarity of the case is interesting: the surroundings of both supra-renals were free. As is well known, immediately beneath them lies the solar plexus with a rich sympathetic system. In the majority of cases of tuberculosis of the supra-renals, associated with Asddion's disease, they are found to involve, by adhesion or extension, the underlying sympathetic system. Whether this absence had anything to do with a lack of development of Addison's syndrome in this case can, of course, not be definitely stated, but a record of this observation seems worth while. Earlier ob-

servers of Addison's disease, as, for instance, Virchow, were inclined to attribute much greater significance to the involvement of the neighbouring sympathetic structures than to the supra-renal itself, and Virchow stated that other lesions in the situation, as inflammations or growths from the stomach or glands might be associated with Addison's syndrome, if they affected this sympathetic plexus. Later investigators have, however, denied this and attributed the disease to an interference with the internal secretion of the supra-renal gland. It seems difficult to see how any secretion could have been continued in this case. No other, accessory, supra-renal glands were found at autopsy. One must, therefore, suppose that other parts of the chromaffinic system compensated.

Demonstration of lantern slides illustrating diseases of the auricle with electro-cardiograph charts, by Dr. J. C Meakins.

Discussion: Dr. T. F. Cotton: These slides of Dr. Meakins are of particular interest to me, and I am sure to all of us who are interested in heart work. The newer methods of examining the heart tell us a great deal about the significance and nature of disorders of the auricle and the important rôle they play in producing heart failure. Perhaps there is no alteration in the mechanism of the heart that is of more interest to the clinician than great acceleration of the auricular rate, both as an explanation of the symptomatology and as an indication for treatment with drugs of the digitalis group. As Dr. Meakins has shown, there is a very close relationship between auricular flutter, premature auricular contractions, and auricular fibrillation. In many cases the onset of the auricular flutter is preceded by individual isolated premature auricular contractions for a period of months. A large number of cases of auricular flutter, certainly the majority of those which we treat, terminate in fibrillation. The symptoms of auricular flutter depend not so much upon the auricular tachycardia as upon the great increase in the ventricular rate. Auricular flutter may be present in a heart that is apparently healthy, yet that heart, if the paroxysm be of sufficient duration, will eventually suffer from the great work put upon it and dilatation and venous stasis are not rare sequelæ. There will be a quick return to normal in the healthy heart with the resumption of the normal rhythm. It is, however, quite different with the diseased heart; one with mitral stenosis, for instance; this is a heart which has, perhaps, already lost a great deal if not all of its reserve and it cannot support the burden that has been put upon it and heart failure may result. There are three things which we may hope to do in these cases, with digitalis, when given in large doses; we may either bring on auricular fibrillation which is temporary and which is followed by a normal rhythm, or the fibrillations may remain permanent, or we may be forced to give digitalis for a long time and not succeed in more than reducing to within normal limits the ventricular rate. Those cases in which fibrillation remains permanent certainly are improved subjectively; they lose that sensation of oppression in the chest and that feeling of fluttering in the region of the heart. In those cases in which we only succeed in increasing the heart block we can prolong the life of the patient for many years.

The case which Dr. Oertel has shown is particularly interesting in association with the last slide Dr. Meakins presented. I remember a case of complete heart-block under Dr. Finley, with Stokes-Adams syndrome extending over a year. With each fit for three minutes there would be no heart sound and no pulse, then the heart would start to beat and then a high-tension pulse of 120. Each time following a fit it would be 120 and gradually within five minutes would slow down again to its normal rate of 32. The slide which Dr. Meakins showed, giving a series of ventricular premature contractions almost presenting tachycardia, was most interesting. My case showed a similar electric curve, a complete heart block, the same dissociation of the auricles and ventricles, and these ventricular premature contractions occurring in succession were the cause of the increase in the pulse rate. The patient died and post mortem examination revealed a large heart with considerable myocardial degeneration. The heart was lost and section could not be made.

PAPER: The use of salvarsan in pernicious anæmia, by Dr. H. A. Lafleur.

DISCUSSION: Dr. C. F. Martin: We are all much indebted to Dr. Lafleur for his very lucid description of the cases he has treated by this method and we are all struck by the fair proportion of cases that have been improved by it. The experience of a good many has been not quite so satisfactory. It seems to me, as I noted the blood count, that none, or comparatively few, if any, have a very high blood count even when most successfully treated; the hæmoglobin rarely rose above 50 per cent. and comparatively few of the red cells rose above three million. However, the subjective improvement seems to be so very marked in some that Dr. Lafleur is to be congratulated. In a few cases in which we have used it in the Royal Victoria Hospital we were not so fortunate in our results. In one case there was a slight increase in temperature and rigours and the patient went from bad to worse and succumbed to the disease under the clinical picture of septicæmia. A great deal of improvement has followed this treatment, probably more than by any other, and yet I think cases sometimes have improved quite as remarkably by other means; such, for example, as saline injection, transfusion, and sometimes even by the much despised cacodylate of sodium. I think there are a great many cases which will naturally get well for a time no matter what the treatment and although these cases may not be classed as cured they certainly show a very marked improvement.

Dr. M. Lautermann: As one who has had occasion to use a great deal of salvarsan during the past five years, Dr. Lafleur's contribution to-night presents many points of interest to me. It is gratifying to know that the sphere of usefulness for this arsenical preparation is extending. I should like to ask Dr. Lafleur if a Wassermann reaction was made in each one of his cases to exclude lues; some writers have held that pernicious anæmia is often due to latent or remote lues and I have felt myself that it probably might be well to be sure on this point in the treatment of the condition. Another factor that occurred to me, particularly in the second case where the neo-salvarsan had been used, while in the other eleven cases the old salvarsan proper was employed; it occurred to me that neo-salvarsan, being less toxic might possibly have been better tolerated. I have treated three cases of pernicious anæmia with neo-salvarsan, one case of my own and two brought to me by a confrère. The first is still alive and after four years is very comfortable, and one may be justified in regarding this as being cured; the other two cases were both improved, one treated ten months ago is still doing fairly well and still taking arsenic by mouth, the other was lost sight of. I do not know that we can claim for salvarsan or neo-salvarsan, any more than for arsenic, that it will bring about a cure, but there is one thing we can claim for it and that is much more rapid action than any other preparations with which we are familiar, and it does not appear to lose its efficiency when used in relapses, which frequently occur.

Dr. H. A. Lafleur: Of course I sedulously avoided using the word "cured" in this connexion. All I wanted to maintain is that having treated cases of pernicious anæmia for some time, and using various things, I have never seen results quite so good as this. I have treated cases with Fowler's solution and, to begin with, the majority of people do not stand large doses. I hope Dr. Martin understood that I was not speaking of cure in these cases and I specially laid stress on the fact that I was not by any means going entirely by the blood picture. On the contrary many patients feel very well with a lower blood picture than those with a high one, and they must be really in as good condition. After all, subjective sensations must count for something, and one's capacity for living a more or less normal life. I am just really experimenting with salvarsan and I am quite pleased with it so far; and I have not had other results that are at all comparable to these. As to the Wassermann reaction I think I stated that in some of the reports it was positive and in others negative, but whether the test was done in all the cases I cannot say. As far as neo-salvarsan is concerned, I only used it in case No. 2, and one would expect that this was quite as efficient as the other preparations.

Case Reports: 1. Two cases of diaphragmatic hernia, Dr. J. Stowers.

2. Case of relapsing fever in a laboratory boy who contracted the disease by allowing a tick, which had been brought here from South Africa, to bite him. Dr. J. Stowers.

The tenth regular meeting of the Society was held Friday evening February 19th, 1915, in the Montreal General Hospital. The members of the Society were the guests of the Medical Board of the Hospital and the following programme was arranged by a committee appointed by the board, of which Dr. E. M. von Eberts was chairman.

Part I (Surgical Theatre): A case of enlarged spleen in a young child; regarded as an early stage of Gaucher's disease, Dr. Blackader. The differential diagnosis between tic and chorea, Dr. Shirres. A diphtheria carrier, Dr. A. H. Gordon. Subacute bacterial endocarditis, Dr. Lafleur. The new department of remedial gymnastics, Dr. Harvey. B. typhosus osteomyelitis, Dr. Hutchison. Nail extension for fracture of femur, Dr. Elder. Case of appendicular gastralgia, Dr. Bazin. Case—Carcinoma of ampulla of Vater; excision; recovery, Dr. von Eberts. Acute hæmatogenous nephritis, Dr. Patch. Decompression for fracture of skull, Dr. Henry; *X*-rays of stomach following gastro-enterostomy, Dr. Wilkins. Vincent's angina, Dr. Hamilton. Fracture of nose; *x*-ray, Dr. Craig.

Part II (Governors' Hall) Exhibits: Typhoid and paratyphoid fever charts, Dr. Lafleur. *X*-ray plates, Dr. Wilkins. Pathological specimens, gross and microscopical, Dr. Rhea. Photographs of skin diseases, Dr. G. G. Campbell. Apparatus for intravenous anæsthesia, Dr. Hepburn.

Demonstrations: Pathological specimen, Epidermoid carcinoma hand, Dr. Bazin. Laryngeal tumour, Dr. Hamilton. Laryngeal tumour, Dr. Craig. Case—Bone graft for the relief of Talipes equino varus, Dr. Nutter.

Part III (Eye Section): Demonstration in small surgical room of a series of living cases, chiefly congenital abnormalities, Dr. Mathewson.

Part IV: Demonstration of the electro-cardiograph.

Dr. W. Grant Stewart called the meeting to order and Dr. J. Alex Hutchinson was chairman for the evening.

At the conclusion of the programme, coffee and sandwiches were served in the Governors' Hall.

The eleventh regular meeting of the Society was held Friday March 5th, 1915, Dr. W. F. Hamilton, president, in the chair.

Dr. A. D. Blackader presented before the Society some notes he had made of the New British Pharmacopœia.

Case Reports: 1. Primary syphilis of the conjuctiva. 2. Fibroma of the orbit, by Dr. G. H. Mathewson.

Dr. L. J. Rhea showed a slide from the fibroma case.

Papers: 1. Some observations on eclampsia, by Dr. T. F. Cotton. This paper was discussed by Dr. Horst Oertel and Dr. H. M. Little.

2. Back ache, corsets, and high heels, by Dr. J. Appleton Nutter, illustrated by charts.

The twelfth regular meeting of the society was held Friday, March 19th, 1915, the president, Dr. W. F. Hamilton, in the chair.

Pathological Specimens: Series by Dr. Horst Oertel

1. *Unusual aortic and pulmonary ulcerative endocarditis with double perforation.* This specimen is from a patient who was in the Royal Victoria Hospital, under the care of Dr. Hamilton and particularly studied by Dr. M. E. Abbott, with a clinical diagnosis of malignant endocarditis. The case will be reported in detail later by Dr. Abbott. Suspicion was entertained during life of the patient that a communication existed between the right and left heart. At autopsy was found an ulcerative and productive endocarditis, extraordinary in position and extent. It involved the pulmonary and aortic valves with their adjoining endocardium. The endocarditis was ulcerative in so far as it had led to great de-

struction of both valves; productive, as it had caused the formation of multiple large polypoid vegetations on the valvular cusps which, by continuity and contiguity had extended to the parietal endocardium on both sides. This is more pronounced on the right side. The vegetations are at least partly organized and are firmly attached to the valves and parietal endocardium. The interest in this case is heightened by the fact that there are two communications between the right and left sides; one from the sinus of Valsalva of the middle cusp of the aortic valve by an aneurismal pouch which is directed towards, and has perforated into, the right ventricle immediately below the pulmonary valve; the second communication is established through the musculature of the interventricular septum immediately below and between septal and middle cusps of the aortic valve by an irregular ulcerated canal. In this regard it is interesting and important to enquire into the possibility of previous developmental cardiac anomalies which might have determined the seat and extension of the lesion. For it is known, of course, that cases of malignant endocarditis may, as their point of predeliction, occupy, particularly, septal cardiac defects. Without going into details as to the complicated development of the heart, we may recall here shortly that heart anomalies occur generally as the result of either of two development faults; first, failure in fusion of primary septa; second, irregular and faulty development of septal limbs. The latter occurs especially through certain inhibitory actions which allow parts of an advancing septum to develop more rapidly than others, thereby destroying developmental continuity. This may happen in the interventricular septum, which divides the ventricles and which develops by a dorsal and ventral limb, the former growing, even under normal conditions, more rapidly than the ventral one. Consequently developmental communications occur almost entirely at the point of fusion of septa, or, occasionally, within the course of a septum. But in this heart neither communication between the right and left ventricle is in a situation which may readily be accounted or by such developmental faults. On the contrary, it appears that development of the septa as well as their fusion and the division of aortic trunk into aorta and pulmonary artery have been quite well performed. If this point is against a developmental communication between left and right heart, we possess, in addition, the anatomical evidences of the perforations themselves. The one is a definite aneurismal pouch whose walls and orifices are beset with necrotic vegetations. The other is a ragged irregular canal with no evidence of a previous definite communication. It is surrounded by thickened endocardium and vegetations. In view of these facts it appears that the weight of evidence points to a purely ulcerative double perforation between the two sides.

2. *Extensive congenital hydrocephalus in a child of seven months.* The patient was under the care of Dr. Archibald. On the death of the child Dr. Archibald immediately injected both carotids with 10 per cent. formalin, with the result that the specimen was found at autopsy, some hours afterwards, in an extremely good state of preservation. It is quite typical in general character. The tremendously dilated lateral ventricles practically control the whole brain area and this dilatation extends well into the anterior and posterior horns. It is interesting to note that the grey matter of the cortex is relatively better preserved than the white matter. Of the occipital lobe, particularly, all that can be seen is a thin covering, made of flattened convolutions of grey matter with no white substance at all. The basal ganglia are nearly entirely lacking and only anteriorly a part of what appears to be the corpus striatum, over which hangs the choroid plexus, exists. The anterior part of the much dilated third ventricle shows the anterior commissure in the form of a thin thread. The duct between the third and forth ventricle is short and wide and there is no obliteration of the spinal canal. This specimen is interesting because it throws some light upon a disputed point in the pathogenesis of congenital hydrocephalus; namely, whether it is due to obstruction or obliteration within the ventricles or ducts of the cerebro-spinal canal. In this case there was certainly no evidence that any such obstruction, either of developmental or inflammatory origin, existed anywhere. It seems also questionable to me whether cases of congenital hydrocephalus can only be attributed, as has frequently been done, to hyper-secretion of cerebro-spinal fluid. It seems at least plausible to assume that, in addition, a lack of development of brain substance is concomitant and possibly precedes it and that the tremendous increase in fluid may at least partly be accounted for by the lack of normal advance in development of brain substance.

3. *Amyloid degeneration of liver, spleen and kidneys following Pott's disease.* Presentation of a typical "sago" spleen; a liver with a rather diffuse amyloid degeneration, which, however, was not massive but only involved extensively the capillaries; and a kidney with amyloid degeneration of the glomeruli, following a case of Pott's disease and hip-joint tuberculosis.

4. *An unusual splenomegaly.* This extraordinary spleen, which will form the subject of a later detailed publication, was an accidental finding in a recent autopsy of a man who had died shortly after an accident. There is practically no history to this case. The only knowledge we have is that he was struck on the perineum and scrotum by an iron bar while at work, which immediately was followed by great pain and marked swelling of the parts. The following day he was admitted to the Royal Victoria Hospital. The findings then were: male of forty-two years, fairly well nourished with markedly swollen scrotum, size of a grape-fruit, deep purple in colour. Right groin also swollen and discoloured as far as the anterior superior spine of the ileum. Of his previous history we only know that he had pleurisy on the right side three years ago. His condition continued fairly good, but on the sixth day after admission evidences of an infection were found which were relieved by multiple incisions in the right groin and scrotum and drains inserted. During the following night he had considerable hæmorrhage and developed rapidly the symptoms of a general septicæmia. He died during the evening of the seventh day after admission.

At autopsy the tissues of the scrotum were found œdematous and gangrenous and the adjoining perineum equally so. There existed also a hæmatoma of the abdominal wall extending from the pubis to about 2 cm. below the umbilicus. The heart showed a marked concentric hypertrophy of the left ventricle. The right pleura showed adhesions between the lobes, but was clean over the surface. On the surface of the lower lobe of the left lung there were a few minute tubercles, and near the base there was a larger calcified, slightly contracted, superficial area, but the apex was free. A very unusual condition, however, was found with regard to the spleen. This occupied almost completely the left hyperchondrium and was adherent by dense old fibrous adhesions to all the surrounding organs and structures. Above it was bound firmly to the diaphragm, on the side to the stomach and tail of pancreas and below to the kidney and supra-renals. On removal it was found very markedly enlarged (weight 1225 gm., measurement 12 × 12 × 9 cm.). The surface showed deep scar contractions, dividing it into irregular lobes and giving the organ somewhat the appearance of the lobated liver in syphilitic cirrhosis, while its surface, however, was not irregular, granular or nodular. The organ as a whole was firm and on section it cut firmly, leaving a smooth surface which presents a very characteristic mottled appearance due to diffuse irregular markings on a pale greyish ground substance. These markings are made up of reddish streaks, dots and blotches. In addition to these there occur, particularly at the periphery, fibrous scars, corresponding largely to the interlobar depressions and extending into the spleen as irregular trabeculae. These traverse the spleen in the form of whitish hyaline bands which occasionally show a yellowish discolouration. They often surround and follow the course of blood vessels within the splenic substance so that their walls are surrounded by thick yellowish white scar tissue. Where these vessels have been cut in longitudinal section, they may be followed in the form of threads or short bands. Occasionally such blood vessels occur within the previously described hæmorrhagic blotches and streaks. It will be seen from this description that we are dealing with an unusual type of splenomegaly and it is not easy to decide what etiological factor may be responsible for it and how to classify it under the existing categories of splenic enlargement. That it is not due to the septic condition, in other words, that it is not an acute splenic hyperplasia, seems quite certain, but it also does not fit in with the chronic types of splenic enlargement which occur in chronic infections or in diseases of the blood. The microscopic examination, which, of course, has not been completed, seems also to exclude the unusual forms of chronic splenomegaly which are grouped under the term of Gaucher's type. There remains the infective granulomata. Whether we have to do with an unusual form of tuberculosis or syphilis or a lesion related to Banti's disease must be left to a future decision, which I hope to make when the case is reported in detail. It is unfortunate that the clinical history of the case is so incomplete and that no knowledge of blood examination during life is available. The case, aside from its scientific importance, is certainly interesting from a clinical stand-point, for it illustrates how frequently diseased conditions may exist in persons considered healthy for all practical purposes and that only an autopsy will give us all the desirable information.

Discussion: Dr. A. D. Blackader: Dr. Oertel, if I understand his remarks aright, regards the existence in chronic hydrocephalus of any obstruction of the ducts at the base of the brain, which permit fluid to escape from the lateral ventricles, as being disproved. Does he thereby exclude inflammatory processes at the base of the brain producing an occlusion of these ducts as a cause of hydrocephalus? I have always considered that chronic hydrocephalus might be due to several quite distinct conditions, but have always regarded acute or chronic inflammations of the meninges at the base of the brain as a very definite proven cause of some cases of hydrocephalus in infancy.

Dr. H. Oertel: My remarks were made with reference to developmental or congenital hydrocephalus. I think we must, at the beginning, separate cases of hydrocephalus into two categories, namely, those which are truly developmental and those which are acquired. A considerable number of cases of hydrocephalus which occur after birth belong to the acquired type, and it is quite possible that these occur as the results of inflammatory lesions or obstructions within the ventricles or intercommunicating ducts or meninges. These lesions, however, are, as the case which I presented to-night illustrates, absent in the true developmental hydrocephalus and it, in my opinion, depends upon an inhibition in the formation of brain substance which allows the accumulation of fluid, more or less, as a compensatory process.

DEMONSTRATION: A series of fractures, illustrated by *x*-rays, By Dr. F. R. England.

CASE REPORT: Coma with acidosis, in a case of acute artnritis, by Dr. W. F. Hamilton. The patient was a young woman who had just weaned her child and the breasts were still full and active. She developed an acute arthritis and was placed under treatment with sodium salicylate when marked signs of acidosis and coma supervened. The patient recovered. (A full report of this case will appear later.)

PAPER: The paper* of the evening was read by Mr. V. H. Mottram of the Physiological Department of McGill University, on Fat metabolism including its relation to acidosis.

DISCUSSION: Dr. A. D. Blackader: The case just cited by Dr. Hamilton is one of much interest. The dose of the salicylate was not in my opinion excessive, and any tendency to the production of acidosis was well safeguarded by the amount of sodium bicarbonate combined with it. The results produced, if they were entirely due to the salicylate, were certainly very rapid in appearing and I think must be regarded as an unusual idiosyncrasy on the part of the patient. Occasionally very marked cases of idiosyncrasy to the action of this drug are reported. I would like to ask Dr. Mottram to tell us the reason of the enlargement of the liver which frequently occurs in acidosis in infancy. In my experience an amount of fat in the infant's dietary exceeding 4 per cent. is very liable to give rise to symptoms of acidosis with marked enlargement of the liver. In these cases we meet with vomiting, a peculiar rapidity of breathing, an absolute inability to take food, especially if it contain fat, and a liver, of which the lower margin may reach the level of the umbilicus. In one fatal case in which I was able to secure an autopsy Dr. McCrae stated the liver to be loaded with fat. One of the early symptoms of the development of acidosis is the ammoniacal smell which the urine in this condition develops, owing to the conversion of a portion of the urea in the system into ammonia which is then used for neutralizing the acid in the system, and is promptly eliminated in the urine. I would be glad to be informed by Mr. Mottram whether in the infant we should always regard an ammoniacal odour to the urine as an indication of an early stage of acidosis.

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*See page 603.

Dr. D. J. Evans: I have been much interested in this paper by Mr. Mottram and also in Dr. Hamilton's case; there is much that is suggestive in both of them. As to the question of the lactation in Dr. Hamilton's case; it has occurred to me that it is possible the symptoms had something to do with it. The breasts were engorged at the time of admission to the hospital and the patient may have been one of those women who are exceptionally good nurses. The urine showed that there was an absorption of lactose; may there not also have been an undue absorption of fat in the same way? If she had not been in a state of active lactation at the time, when the fat metabolism was undergoing active work, there might not have been the same results.

Dr. Mottram's paper as to the condition in pregnancy and during lactation of the fat metabolism is extremely interesting. It has always been an extraordinary thing to me to notice the great similarity in the phenomena of the acidosis of pregnancy, with what one meets in childhood; the symptoms are so similar. I have never understood how it is that women have this acid indigestion in pregnancy. The excessive demands upon the liver in this direction are probably the explanation of this form of acidosis in pregnancy that is so frequently met with. It is probably along this line where the liver breaks down under the strain, that we have the eclamptic state developing, when the condition passes over from the physiological to the pathological. The whole subject is one of great interest. These are the first steps that are being taken up just now by various observers along the lines of the metabolism of pregnancy, and in this study we find the liver and the metabolism of fat playing a very interesting rôle.

Dr. H. Oertel: I think that, in a general way, pathological anatomists and physiologists are in agreement to-day on the subject of fatty infiltration and we all agree that even an appreciable amount of fatty infiltration may occur in an organ under perfectly normal conditions. On the other hand, I do not believe that all fatty infiltration of organs may be regarded as normal or comes within physiological limits. It is, of course, true that fatty infiltration in itself does not, strictly speaking, constitute a pathological condition of cells, but I think we must admit that excessive and permanent fatty infiltration of an organ marks more or less definitely an injury to its cells and, therefore, makes that organ pathological; for it certainly indicates that the healthy metabolism and the regenerative ability of the organ have suffered and that it keeps itself alive under difficulties with the aid of fat as an easily combustible substance. Thus we see degenerative changes, atrophy, or other nutritive disturbances in cells frequently associated with fatty infiltration, and this may be followed by return to healthy conditions or, in lasting injury, to progressive and permanent fatty infiltration. In these cases fat can be seen to infiltrate gradually the cells of the organ in the form of typical, usually large, fat drops which are deposited within the cell body, where they acquire more and more room at the expense of the protoplasm and gradually squeeze the nucleus towards the cell membrane. Now I think we must, even to-day, differentiate, as much as Virchow did formerly, this form of fatty change in organs from another which Virchow named fatty degeneration, although we hold to-day different views as to its character than he did. This type of fatty appearance in organs occurs usually in more rapid and virulent protoplasmic destructions. It does not, at least in the beginning, show the gradual large fat drop infiltration as previously outlined, but fat or physically fat similar, small, almost pin or dust-like, droplets appear diffusely, although rather irregularly, within cells whose protoplasm and nuclei show the severe qualitative changes incident to rapid disorganization of cell constituents. We interpret this lesion at present as an active cell destruction in which lipoid and cholesterin drops are released from the emulsified non-visible state within normal protopasm. It is this type of fatty change in organs which occurs within severe toxic, often rapidly fatal, lesions and which in its character and genesis seems to stand out more or less sharply from that of fat infiltration by ordinary glycerine esters. Undoubtedly both forms of fatty changes are frequently found combined, probably always in cases where death does not rapidly supervene and when restitution to integrity takes place, or is at least attempted, in the manner which has been so well described by Mr. Mottram to-night.

Mr. V. H. Mottram: In answer to Dr. Oertel I may say that I do not think my point was that fat infiltration of *any* organ is physiological, but that fat infiltration of the liver is physiological. In no case that I have dealt with can the tissue be called in any way pathological. Histological preparations have always been made and there is no sign of damage to the nucleus, etc. I think I would go so far as to say that fat percentage in the fresh liver may vary between 2 and 22 without there being anything wrong with the liver; but as regards the heart and kidney it cannot go above 3 per cent. without there being something decidedly wrong. We have yet to settle how far a liver can function normally when there is a large amount of fat present. To judge from the literature of the subject you can have big infiltrations without serious consequences.

As regards the case which Dr. Hamilton reported I may say that I have found nothing in a recent view of the action of salicylates to lead one to expect an acetonuria. But there is undoubtedly disturbed fat metabolism in his case and the acetonuria may be not only an indication of the mobilization of fat from the mammary gland but also from the fat depôts. The temperature chart shows that the temperature of the patient went, on February 3rd, below normal and that the acetonuria then developed. I found that my animals at the end of the first day of hunger had a subnormal temperature; they then called on their reserve fat, and after that the temperature went above normal. I would like to suggest that the fall in temperature is the signal for fat mobilization, and that, in Dr. Hamilton's patient there was mobilization occurring on account of the subnormal temperature.

Regarding the point that Dr. Blackader raised, the enlargement of the liver that is seen sometimes in children, accompanied with acidosis, this may possibly be the result of a fatty infiltration. Certainly in a large number of animals I have seen, when there has been an excessive amount of fat in the liver, the liver looks yellow and swollen, feels firm, and tears in a quite different way from that of glycogenic liver.

As regards the ammonia in urine in fat metabolism and acidosis I think it is pretty clear that wherever there is an acidosis you get an excess of ammonia. The two run parallel. The explanation that physiologists give is that it is not ammonia formed *ad hoc*, but ammonia caught on its way to conversion to urea. It is linked with the acid and excreted as such.

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THE PHARMACOLOGY OF ANIMAL EXTRACTS

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IT would be both valueless and indeed impossible in a paper such as this to consider in detail the pharmacological actions which have been ascribed to all the various animal extracts which have been tested experimentally and clinically. We are, indeed, at once led into the bewildering labyrinth of facts and supposed facts relating to the physiology of the organs of internal secretion. Few, indeed, of the extracts upon the market have any proved pharmacological actions and fewer still have been sufficiently studied to justify their employment in medicine, and I would like to utter a word of protest against the credulity with which physicians listen to the statements of the manufacturers of animal extracts, and supposedly find these statements confirmed by the histories of the cases in which they employ them.

Adrenalin is the only one of these substances which has been isolated in a pure state. It can now be prepared synthetically and has been thoroughly studied. It is a labile substance, and hence when given per os, it has only a local effect in the mouth and stomach, hypodermically its effect save in large doses is small, but if applied intravenously it is marked, though transitory. In every case it exerts its action by stimulating the endings of certain sympathetic nerves. The sympathetic nerves, it will be recollected, leave the spinal cord by the anterior roots in the thoracic and lumbar regions and pass to the ganglionated chord. In one of these ganglia, or in some instances in a more peripheral ganglion, *e.g.* in the cœliac plexus, this fibre ends in contact with a ganglion cell from which fibres pass either to a gland or to an unstriped muscle. It is on these endings in gland or muscle that adrenalin acts.

Opening the Symposium on Animal Extracts, meeting Academy of Medicine, Toronto, January 5th, 1915.

Let us then consider serially its effects when given intravenously. It stimulates the endings in the radial muscle of the iris, dilating the pupil. This will not occur when instilled into the conjunctival sac of man, as its absorption is too slow to overcome the normal tone of the sphincter iridis, unless the sympathetic endings are more than normally susceptible, as for example in many cases of pancreatic diabetes, exophthalmic goitre (Loewi) or succeeding the administration of cocaine (Fröhlich and Loewi), when dilatation occurs more or less promptly. It stimulates weakly the salivary glands and causes prompt fall of tone and inhibition of movement in the stomach and intestines. In some cases it may be used with advantage to produce prompt relaxation of the spasm causing hour glass stomach, and in this, as in other cases of spasm, a hypodermic administration is usually prompt and successful. It has a parallel effect on the bronchial muscles and a hypodermic injection almost invariably succeeds in relieving an attack of asthma (Januschke and Pollack). It accelerates the heart, and increases its out-put per beat (Oliver and Schäffer) and may well be exhibited in cases of acute poisoning by chloroform. It constricts the arterioles; when given intravenously it produces a rise in pressure, which, if marked, causes the lungs and brain to be greatly congested and often the limbs as well. The coronary vessels are dilated by it (Langendorff). It has been frequently employed to prevent bleeding from the gastro-intestinal tract, but this is entirely irrational, as the vessels in the bleeding area will rarely be normal and will in consequence not re-act to adrenalin and hence increased bleeding will result. It has been used intravenously in very dilute solution—100,000 to 1,000,000 in sature to relieve the low blood pressure in infective conditions, *e.g.* peritonitis (Heidenhain) and pneumonia (John) and against surgical shock (Kathe), but is not invariably successful. As adrenalin is readily absorbed by mucous membranes, it comes into contact with underlying arterioles and constricts them, thus lessening bleeding and congestion and decreasing the rate of absorption from the stomach, *e.g.* in cyanide and aconite poisoning (Jona). It will produce a similar local effect if applied subcutaneously or to a wounded surface. The urinary bladder is relaxed and its sphincter increased in tone. The pregnant uterus of all animals contracts mightily and in some few cases its hypodermic administration has been successful in arresting a post partum hæmorrhage (Neu). In susceptible persons its administration may produce a hyperglycæmia and the appearance of sugar in the urine. The temporary and evanescent character of its action must in all cases be borne in mind.

Pituitary extract has only of late years been fully studied. Its active principle has not been isolated. It is much less labile. The extract of the posterior lobe acts apparently upon gland and muscle tissue directly. On the heart it produces slowing with usually some increase in out-put, but its effect on the cardiac blood supply is bad and some authorities consider its entire cardiac action to be deleterious (Tigerstedt and Airila). The action of a second injection in animals often causes a fall in blood pressure. It causes a marked increase in the tone and movements of the intestine and hence is of value subsequent to abdominal operations, though if distension becomes extreme before it is displayed, it rarely has any effect. It also increases the tone and movements of the urinary bladder and again shows its value when employed after laparotomy or post partum (Jaschke). Its most important use is undoubtedly in the second stage of labour when the uterine movements cease or become weak. It then produces increase of movements with relatively little increase of uterine tone, so that a uterine tetanus is exceedingly rarely seen. Owing to its not producing an increase in tone it is of much less value post partum than ergot. In some cases it is successful in producing abortion or bringing on a labour at full term (for literature see Harrison and Watson). In certain animals the injection of pituitary extract causes a flow of urine, but it is by no means clear that this is not secondary to its action on the vascular system. Subcutaneous injection of pituitary extract also produces a marked flow of milk (MacKenzie, Ott and Scott) with a richer fat content, but this primary effect is compensated by a decrease in the milk produced subsequently (Hill and Simpson) and possibly in the fat content also (Hammond). There seems little reason for its employment clinically as a lactagogue though some observers think that they have used it with advantage (Reynolds). The hormone having this lactagogue action is probably distinct from that acting on muscle (Herring).

The connexion between the activity of the pituitary gland and growth as instanced by acromegaly is well known, but this metabolic side of the gland's activity as yet presents no clear cut principles for treatment.

Thyroid extract does not seem to have the direct action on muscle and glands that the two above mentioned extracts possess. Its action is much less well known in detail. Its exhibition stimulates metabolism in an important fashion. Feeding small amounts of thyroid tends to increase the appetite of white rats and leads to an increased retention of nitrogen and an increase in weight, while larger amounts though increasing the food consumption lead to a decrease in weight and a marked increase in the loss of nitrogen (Hewitt). Based on such facts thyroid has been used successfully in many cases of obesity, but the treatment must be carried out under the strictest chemical control and it is wise to increase the normal nitrogen ration of the patient during the treatment. The treatment not infrequently produces a transitory glycosuria. The use of thyroid in thyroid insufficiency is too well known to need any comment.

In exophthalmic goitre there is a marked increase in the sensitivity of all sympathetic endings for adrenalin and indeed the classical picture of the disease suggests a hyperactivity of this system.

Every breeder of animals is aware of the effect produced by castration either in the male or female and the marked increase in fat deposit that occurs. This change in animals is dependent upon a decreased oxidation (Lowy and Richter) and when it occurs it can be overcome by the administration of ovarian or testicle substance, though such administration has no effect on normal animals. The literature dealing with the effect of the administration of ovarian substance or extract on the monthly cycle of the uterus presents such a wilderness of contradictions that it seems impossible to formulate any proper indications for its employment.

Administration of pineal gland to young animals also leads to an increased rapidity of growth and apparently precocious sexual development (McCord).

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ORGANO-THERAPY IN OBSTETRICAL AND GYNAECOLOGICAL PRACTICE

By B. P. Watson, M.D., F.R.C.S.E.

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THE part assigned me to-night is to initiate the discussion on the therapeutic application of animal extracts in obstetrical and gynæcological practice. In the fifteen minutes at my disposal it is impossible to cover such a large subjcet, so I shall limit myself to a general survey and leave the details to be filled in by those who follow on in the discussion.

Whilst there has been a great deal of work done in recent years on the relationships between the various ductless glands and the female genital organs, the whole subject is still in a state of confusion, and it must remain so until the inter-action of those various secretions is more fully understood. This knowledge can only come from careful experiment and the co-relation of closely observed clinical phenomena and post mortem findings.

It may be fairly stated that the only animal extract which can be depended upon to produce definite effects on the female genital organs is that derived from the posterior lobe of the pituitary body. The use of one or other of the various pituitary preparations for the strengthening of labour pains has become so general and the literature on it so extensive that I do not intend to say much regarding it now. I shall content myself by giving the conclusions from a paper recently read by me before the Canadian Medical Association.

1. Pituitary extracts have a powerful effect in inducing and in strengthening uterine contractions.

2. The type of contractions induced is similar to that which occur normally, although at first there may be a tendency to prolongation of the pains.

3. Such prolonged contractions result in slowing of the fœtal heart, but the child is seldom in danger.

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4. When given in the late part of the first and in the second stage of full time labour the polarity of the uterine contractions is not interfered with, but in early abortions and early in the first stage a simultaneous spasm of the os may occur.

5. Its chief field of usefulness is at the end of the first and in the second stage of labour, when there is delay due to feebleness of the pains, alone or when combined with other complications, such as malpositions of head, malpresentations, multiple pregnancy, slight narrowing of the pelvis, etc.

6. In the induction of abortion, in the treatment of abortion already in progress, and in incomplete abortion, its action is so uncertain that it is not to be recommended except in cases where the os is widely dilated.

7. In the induction of premature labour its effects are uncertain, but if sufficient dosage be given they may be good.

8. In the induction of labour at full term and after, better results are obtained than in premature cases.

9. It gives good results in many cases of post-partum hæmorrhage, but is not superior to the various preparations of ergot. It has the power of sensitizing the uterus, so as to allow these preparations to act more powerfully, the combination being most effective.

10. It is a useful adjunct in the treatment of placenta prævia, used in conjunction with rupture of the membranes, the use of hydrostatic dilators, or turning.

The results obtained from pituitary extracts are so definite and follow so quickly upon their exhibition that they resemble those obtained from drugs. With the possible exception of thyroid extract no other animal product has such definite therapeutic properties.

Little success has attended the employment of other animal extracts in obstetrical and gynæcological practice. The various extracts employed may be given for one of two purposes.

(a) To stimulate the genital functions when they are in abeyance or sub-normal.

(b) To restrain hyperactivity when there is hyperfunction.

Whilst the ovaries are the organs immediately concerned with the growth and nutrition of the genital organs and with their functional activity, other organs also play a very considerable part. There is a close relationship between all the ductless glands, the secretion of one being antagonistic to that of others or helping out their action. These ductless glands can be grouped according to the effect that their secretion is known or supposed to produce upon the development, growth, and function of the female genital organs.

The Ovaries. These are essential for the development, growth, and function of the whole genital apparatus, and also for the secondary sexual characters of the individual. The ovary possesses this property by virtue of internal secretions which it produces. What the exact nature of those secretions is we do not know, nor do we know absolutely where they are produced. There are three possible sources:

1. The follicular apparatus
2. The interstitial cells of the stroma
3. The corpus luteum.

The secretion produced by the interstitial cells or follicular apparatus or both, is probably responsible for the development of the sexual organs between birth and puberty and for the development of the secondary sexual characters, as we know that removal of the ovaries at an early age results in nondevelopment of the genital apparatus and in the production of a neuter type.

The corpus luteum, now regarded as a derivative of the follicular epithelium although by some looked upon as arising from the interstitial cells, is responsible for the maintenance of the cyclical changes resulting in menstruation and probably for the development of the decidua and the nidation of the ovum.

The other ductless glands also exert a varying influence on the genital apparatus either directly or through the ovaries. Thus we know that excessive development of the adrenal produces precocious sexual development, whilst this also results from early atrophy of the thymus gland or destruction of the pineal body. Hyperplasia of the thymus causes arrest of the development of the genital organs. Deficiency of thyroid secretion results in hypofunction as amenorrhœa and sterility. Deficient function of the anterior lobe of the pituitary produces similar results usually accompanied by marked adiposity.

Conversely the ovarian secretion exerts an influence on the other ductless glands. Castration causes hypertrophy of the pineal gland, the anterior lobe of the pituitary and the adrenal cortex, while the thymus may fail to atrophy.

We can thus see that disturbance in any one of the various organs of internal secretions may have pronounced effects on the genital apparatus resulting in disordered function. In the present state of our knowledge it is often extremely difficult to locate the part of the chain where the break is and much of our organotherapy is consequently more or less haphazard, and the results very varying. We have only to glance at the literature and note the adversity of opinion regarding the efficacy of the various extracts to realize that we are still groping in the dark in this particular subject.

For our present purpose I think the best we can do is to discuss shortly the conditions which are likely to be benefited through treatment with one or other of the animal extracts. These conditions are infantilism, amenorrhœa, dysmenorrhœa, sterility, repeated abortion, hyperemesis, toxæmia of pregnancy, menopausal symptoms (natural or artificial), pruritus vulvæ, deficient mammary secretion.

Infantilism and general underdevelopment of genital organs with absolute or relative amenorrhœa.

Administration of ovarian or lutein extracts sometimes do good in these conditions but the results are by no means uniform. If underdevelopment is marked we would expect to get the best results from ovarian extract and if development were good from corpus luteum extract. It may be said here that there is a great variety of ovarian preparations on the market. Most of them are made from sows' ovaries, but some from cows'. There must be a very considerable variation in the action of those extracts according to the time at which the animals are killed. The corpus luteum of the pregnant animal is probably of greater therapeutic value than that of the nonpregnant (Dannreuther). It may be given as a dessicated substance or as an extract, by mouth or subcutaneously. The dose should be at least 5 grs. of the dessicated substance thrice daily (Dannreuther). Recently some lipoid substances have been extracted which show considerable toxicity when given intravenously. They cause a marked fall in blood pressure and muscular paralysis. If a genital reaction occurs there is flushing of the external organs and menstruation may be established in a few days. In other cases very prolonged treatment may be required and in some no result at all will be obtained.

In such cases of failure especially if the amenorrhœa is acquired and associated with adiposity it is well to try a pituitary extract—from the anterior lobe and that failing to go on to thyroid. The order may of course be reversed. In many cases no response will be obtained to any of these.

In sterility and abortion not due to local or constitutional causes, some successful results have been obtained by lutein therapy.

Similar good results have followed its administration in cases of the hyperemesis of pregnancy. In such, benefit may be obtained by administration of adrenalin in large doses—10 to 20 m. of 1 in 1000 solution thrice daily. In the toxæmia of pregnancy good results have been reported from the administration of ovarian extracts. Similar results have followed large doses of thyroid extracts—notably in the hands of Nicholson, who believes that many of those cases are due to thyroid inadequacy.

One or two observers have reported good results from ovarian and lutein extracts in cases of pruritus and kraurosis vulvæ. The effect of the extract seems to be the vascularization and slackening up of the tissues affected, with immediate amelioration of the symptoms. In some cases of pruritus at or after the menopause it acts almost like a specific.

In the so-called genito-suprarenal syndrome ovarian extract may relieve to a certain extent.

The symptoms of the menopause either artificial or natural may or may not be relieved by ovarian extract. There are many reports in the literature of good results, and perhaps as many where no improvement was observed.

It must be said of ovarian and lutein extracts in all the foregoing conditions that there is no certainty in their action. Generally if benefit is to follow it will appear in a few days. If it doesn't the dose ought to be increased—there is no danger of toxic symptoms if it is given by mouth. One case is reported where as many as 2500 5 gr. tablets were taken. If, however, the blood pressure falls below 90 mm. it ought to be discontinued.

So far as my own experience goes I have only rarely found any decided benefit from animal extracts in any of the conditions named. Where benefit has followed it has generally been after the administration of thyroid substance in cases of amenorrhœa associated with obesity. In the natural and artificial menopause I have got better results from general tonic treatment than from organo-therapy, although in severe cases I always try the latter.

In the toxæmias of pregnancy I generally rely on other means of treatment, although I have seen good results from large doses of thyroid in threatened eclampsia where the patients showed absence of the normal thyroid hypertrophy of pregnancy. I have also had good results in cases of pernicious vomiting from adrenalin, but other forms of treatment have been used at the same time so that it is impossible to say definitely to which the improvement was due.

Various extracts have been tried from time to time, both experimentally and clinically, to influence the mammary secretion. Schickele found that injections of extract of corpus luteum, ovary, placenta, testicle or pituitary failed to produce any mammary enlargement in either castrated or entire animals. Ott on the other hand demonstrated increased milk secretion after injection of ovarian, placental and fœtal extracts. I have used pituitrin as a galactogogue in women who had deficiency of milk with apparently good results.

Ascher has shown experimentally that placental extract causes ovarian hyperæmia and uterine congestion and hæmorrhage, and suggests that placental extract might be useful in the treatment of amenorrhœa and sterility.

To sum up the whole matter it may be said that organotherapy as applied to obstetrics and gynæcology is yet in its infancy, and much more knowledge regarding the inter-relationships of the various ductless glands is required before it can be used rationally; that meantime we should observe carefully all cases in which we employ it and note the results, varying if necessary the substance employed. Only by the clinician working in conjunction with the experimental investigator can we hope to gain further knowledge.

ANIMAL EXTRACTS IN SURGERY

By Geo. Ewart Wilson, M.D.

Toronto

TO the surgeon, the therapeutic value of animal extracts, when compared with other means at his disposal, is indeed small; nevertheless their importance is considerable, and increasing from year to year. Living as we do in an age when investigators in many instances seem to vie with one another to publish their results, it is often difficult for one clearly to see his way. In the following remarks I will endeavour to present some of the more important uses to which animal extracts may be put.

Adrenalin, obtained from the medulla of the suprarenal gland, is the animal extract most commonly used by the surgeon. In combination with cocaine and allied substances, it is in very general use. Barker, of University College Hospital, uses a solution consisting of distilled water 3½ ounces, β-eucaine 3 grains, sodium chloride 12 grains and adrenalin chloride (1-1,000 sol.) 10 minims. Such a solution is non-toxic, so that the tissues can be safely infiltrated with considerable quantities of the fluid. By this means operations of gravity can be performed without pain, including such conditions as strangulated hernia, intestinal obstruction, thyroidectomy for Graves' disease, etc.

The next important use to which adrenalin may be put is in the treatment of shock. Whatever its causation, lowered blood pressure is a constant accompaniment, so that when adrenalin was found to contract blood vessels its employment in shock was a natural consequence. It soon became apparent that unless used intravenously and continuously it was useless owing to the fact that it is very rapidly oxidized and rendered inert. As employed by Lathan and English, a 1-30,000 infusion is passed directly into a vein until the blood pressure rises to about 130 mm. Hg., or if that is not attainable, then till there is a good radial pulse. When this is obtained the solution should then be allowed to run in very slowly about three or four drops per minute. In this way the patient is tided over till reaction sets in. Crile, on the other hand, uses a solution of 1-50,000 to 1-100,000 strength and advises injecting the infusion directly into an artery and towards the heart. In that way he hopes to sidetrack the right heart.

A third use to which adrenalin is frequently put is hæmorrhage from deep seated surfaces, a good example being essential hæmaturia, or ideopathic hæmaturia. In this condition there is hæmorrhage from a kidney which cannot be explained by present knowledge or methods. And if the etiology is obscure, so, too, is the conclusion to be drawn from the published results of cases treated by adrenalin. Molnov gives 20-minim doses every four hours by mouth and claims to obtain results, although it is generally taught that *pèr oram* the drug is useless. M. Freund recommends stypticin in full doses. Hugh Young recently reported a successful case. There was a return some months later which, however, only lasted a few days. Russell reported a cure after a single injection of 15 c.c. of a 10 per cent. solution. On the other hand, Albarran in 1903 reported a case cured by a cystoscopic examination, and refers to a patient of Picqué and Reblaub who diagnosed that the hæmorrhage came from the bladder and did a suprapubic cystotomy only to find that the bleeding came from the kidney. The patient was sent back to bed and an operation on the kidney planned for the next day. The bleeding which had been of long duration ceased spontaneously and no operation was subsequently necessary. Others report the hæmorrhage having stopped from passing a ureteral catheter. While Kelly and Burnan admit that in a number of cases where they tried adrenalin it failed, they nevertheless think it should always be given a trial in essential hæmaturia. In hæmorrhage from the bladder more reliance can be placed upon it and it is frequently used to control such bleeding, the solution being injected into the viscus through the urethra. A further use for adrenalin is found when one wishes the operative field as bloodless as possible, the patient at the same time receiving a general anæsthetic. For instance, Mr. Groves when operating upon the posterior nerve roots for the visceral crises of locomotor ataxia infiltrates the part with suprarenal extract as a routine.

Osteomalacia is another surgical condition which has been undoubtedly benefited by the use of adrenalin. The treatment of this condition has been reviewed by Schriell, covering the last fifteen years. There were in his series 37 cases treated by phosphorus, 105 by castration, 36 by adrenalin, 1 by antithyroidin, 16 by pituitrin, 2 by milk from castrated goats, and 6 by *x*-ray. With but seven recurrences in the series treated by oophorectomy, Schriell claims that this operation still offers the fewest bad results, being much preferred to treatment by hormones such as adrenalin and pituitrin.

A few years ago Leonard Bidwell of the West London Hospital undertook to investigate the effect of pituitary extract on the bowels after abdominal operations and recorded his findings in the *Clinical Journal* of September 6th, 1911. It was tried in 21 unselected cases the majority (19 cases) receiving three doses of 1 c.c. His conclusions were briefly as follows: The extract is able to overcome the temporary paralysis of the bowel due to exposure as evidenced by the early passage of flatus and the absence of abdominal discomfort. In only three cases, however, did the bowels act without an enema thus in every case except two a satisfactory action of the bowels was obtained after a simple enema. Two cases required an aperient. It was observed too that only two cases required to be catheterized. He advises that pituitrin be given as a routine as follows: one c.c. six hours after the operation, a second dose of similar size twelve hours after operation and a third eighteen hours after the patient leaves the operating room. No further dose is administered unless the patient complains of flatulent distension. The injection should always be made into the muscles since that made into the subcutaneous tissue is very painful. Another important use to which pituitrin may be put is in the prevention of shock. In the *Boston Medical and Surgical Journal* of May, 1913, Hill of Pittsburg records his experiences during the preceding two and a half years, his series embracing some eight hundred abdominal operations. All these patients before leaving the operating table were given 15 minims of pituitrin hypodermically. Then when the patient recovered from the anæsthetic, 15 minims more were injected, followed by three more similar doses at three hour intervals. In addition, all received enteroclysis and were put in the Fowler position with the head of the bed raised fifteen inches. For pain or restlessness physostigmine, gr. $\frac{1}{75}$ + morphia, gr. $\frac{1}{6}$ were given, to be repeated in three hours if necessary. Under such a routine Hill says he has not had in any instance a symptom of shock develop. In two or three cases a condition simulating heart exhaustion was noted, possibly due to overstimulation. It was only transient and the patients responded to stimulants after stopping the pituitrin. After each injection the blood pressure rose. It was during this series that he noted the happy elimination of gas from the alimentary tract, the result of increased peristaltic action.

Eberle uses pituitrin in cases of urinary retention. He thinks it acts largely through its diuretic action as he has found that adding a little more fluid to a full bladder is often sufficient to originate the necessary reflex. Jaschke reports that there is less need to use the catheter after the injection of pituitrin.

It is obvious, however, that any routine treatment of conditions which may require active surgical interference is not to be desired. Each case should be dealt with on its merits, otherwise there will be not a few instances where pituitrin has been administered in the presence of some mechanical obstruction to the onward passage of the intestinal contents.

According to Prof. Pal of Vienna, who records his experience in the *Medical Record* of July, 1914, pituitary extract is useful in the treatment of exophthalmic goitre. His patient was extremely emaciated and had trembling of the hands and feet. There was marked diarrhœa, insomnia, vomiting, respiratory troubles, a pulsating goitre, von Graefe's sign, etc. Within the course of two months seventy injections of increasing doses of pituitary extract were administered. His weight very soon increased, respiration and sleep improved and the tremor subsided. Although the patient has not been cured, his condition is considerably ameliorated.

In this connexion one might refer to the use made of thymus extract in treating Graves' disease. M. Englander uses it only in those cases where neither medicine nor surgery have had any effect. The case which Englander presented at the Viennese clinic was that of a girl with considerable dilatation of the heart, a systolic murmur and a goitre. Ten weeks' treatment with thymus extract produced a remarkable result. The goitre diminished and the murmur and nervousness disappeared.

Lastly, the following case, from "Progressive Medicine," illustrating the extraordinary use to which some of these extracts may be put, is instructive. A man fifty-four years of age was suffering from chronic rheumatoid arthritis. He was bedridden with all the joints more or less involved. There was extreme wasting, anorexia, sleeplessness with constant pain. He was unable to feed himself, nor could he raise his arms to brush his hair. It was noted that his skin was rough, dry and harsh and that his hair was crisp. His voice was husky and he had a deep suprasternal notch. He was given five grains of thyroid extract three times a day. In a month the result was remarkable. He could struggle on crutches from one room to another, his appetite had returned and the pain was almost gone. In three months he could walk with two sticks and in eighteen months he could walk three miles with one stick.

Thyroid extract is occasionally administered in inoperable malignant disease. On account of its strong catabolic influence it is expected to produce destruction of the growth. In a few instances, at least, it has been attended by a certain amount of improvement.

The relations existing between the various glands of internal secretion are exceedingly intricate and complicated. Yet, one cannot help but feel that when these relationships are finally unravelled, many diseases now considered as largely surgical in character, as, for example, exophthalmic goitre, will be cured by the proper combination of animal extracts.

It was stated by the Minister of Defence of Australia in June that no less than five hundred members, or twenty per cent., of the Australian medical profession were then serving at the front. A good many others have joined the forces since that time. The universities of Sydney, Melbourne and Adelaide have arranged to hold their examinations earlier than usual and the majority of fourth and fifth year students have already made application for military service.

It is estimated that the equipment of the New Zealand hospital ship will cost £25,000. On June 8th, it was stated that £20,000 of this amount had been subscribed and that the work in connexion with the equipment was well advanced.

Captain R. E. McConnell, of Montreal, has been placed in command of the field ambulance detachment clearing hospital and other medical work in the western section of British East Africa.

ANIMAL EXTRACTS IN RHINOLOGY AND LARYNGOLOGY

By D. J. Gibb Wishart, M.D.

Toronto

THE extract of suprarenal gland has been of great use to specialists in rhinology and laryngology, and chiefly for the purpose of reducing hæmorrhage.

I have for years been in the habit of injecting 10 per cent. solution of adrenalin in the tissues over the mastoid just prior to any operation upon that bone, with the result that bleeding has been thereby greatly reduced, and the operation shortened in the time required for its performance.

In operations upon the nose adrenalin is now usually combined with whatever strength of solution of cocaine may be required, as thereby is not only bleeding lessened, but anæsthesia is greatly prolonged, and in addition a much greater strength of cocaine may be used without symptoms of toxicity being produced, because the adrenalin prevents deep absorption.

In the operations of sub-mucous resection of the septum and of the tonsils, I am in the habit of combining 10 per cent. of suprarenal extract with ¼ per cent. of novocain solution, and injecting this freely. The result is that an almost bloodless operation is secured, and anæsthesia is prolonged even to an hour. This of course is only used in cases where a general anæsthetic is not essential.

The extract is also used in pure solution in cases of epistaxis to stop the hæmorrhage and at the same time isolate the point of erosion. After this cocaine may be applied and a caustic or the cautery used. The combination of cocaine and adrenalin is again extremely useful when we wish to reduce the œdema present about the ostia of the accessory sinuses and the mouth of the eustachian tube, when it is desired to wash out these cavities or inflate the tube.

Presented at the Sympsoium on Animal Extracts, Academy of Medicine, Toronto, January, 5th, 1915.

In the larynx the same remark holds good when we are dealing with œdema, or desire to reduce swelling in order to examine or make applications. I have lately been using hypodermic injections of 5 to 10 minims of the extract, twenty to thirty minutes before passing the bronchoscope or the œsophagoscope, and believe that this measure has been followed by a reduction of the spasm of these tubes.

I have also used similar injections for relief of asthma, but I have not tried the spraying of adrenalin into the bronchial tract through the bronchoscope as recommended by Ephraim in the *Berliner klinische Wochenschrift.*

The extract has also been recommended to define the limits of malignant and lupoid infiltrations, in Quincke's disease when affecting the larynx, and to reduce pain in inoperable malignant disease of the larynx. I have not tried it in any of these.

It has been stated by Sir St. Clair Thompson that a mixture of cocaine and suprarenal extract when combined with a light general anæsthetic helps to reduce shock, but I reported four years ago a case of acute toxæmia attended by acute cardiac dilatation, where a mixture of a 2 per cent. solution of cocaine with an equal amount of full strength adrenalin solution was injected into the tonsils and where there seemed every reason to believe that the cocaine was not at fault. In the same article I referred to a case reported by Hubbard where a patient, a healthy young man under general anæsthesia for a septal operation with every reflex normal, and respiration perfect, was given 15 to 20 minims of adrenalin chloride solution for hæmopytysis, and died.

I have not had any experience with the other animal extracts, but I see that Houssay in the *Wien. klin. Woch.* recommends a combination of pituitrin with suprarenal extract in the proportion of 1 c.c. of the former with 4 to 5 minims of the latter, and states that this mixture may be injected to overcome shock and also that the combination of the drugs intensifies their astringent action, and makes for a very protracted and efficient vaso constriction.

I am initiating some experiments with the use of these latter extracts in otosclerosis, but have nothing at present to report.

ANIMAL EXTRACTS IN OPHTHALMOLOGY

By Newbold Jones, M.D.

WITH the exception of adrenalin the employment of animal extracts in ophthalmology is somewhat limited.

Adrenalin and the related synthetic compounds act upon those elements of the eye which are innervated from the sympathetic system, in the same fashion as very strong stimulation of the sympathetic nerve.

Fractions of a milligramme intravenously cause pronounced mydriasis, which, however, is of short duration, only a few seconds, and may even bring about a momentary increase in the dilatation of a pupil already maximally dilated by atropine. This transient action indicates how momentary is the systemic effect.

When instilled into the conjuctival sac of a normal individual, adrenalin 1 in 1,000 or even 1 in 10,000 powerfully constricts the conjunctival vessels but causes no noticeable mydriasis, likewise none in dogs or cats, but does so in rabbits and particularly in frogs. The susceptibility of a frog's eye to adrenalin is applied as a test for this extract; the iris of a freshly enucleated frog's eye dilates when placed in a solution containing adrenalin. If in the human eye the sympathetic nerve endings of the iris are themselves abnormally excitable, or less inhibited by the antagonistic autonomic mechanism of the oculomotorius than normally, adrenalin causes a sympathetic innervation, also in severe diabetes in man, or in cats and dogs in which the pancreas has been removed. It is possible also that if a patient is under the influence of cocaine, the instillation of adrenalin might dilate the pupil. This reaction of the pupil may consequently have some diagnostic value.

The susceptibility of the entire sympathetic motor mechanism to adrenalin may be enormously increased by the administration of cocaine. Doses of cocaine which by themselves produce no marked influence on the iris of the cat or dog, so act on this organ that instillation of adrenalin causes a marked mydriasis. It might be deducted from this fact that the action of cocaine, which we call

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stimulation of the sympathetic nerve endings, is essentially due to a sensitization of the motor sympathetic nerve endings for adrenalin, which is always present in the blood, though in small quantities. Adrenalin is used to a great extent in eye surgery. Its local vasoconstricting action on the conjunctival vessels and also when injected subconjunctivally on the iris and ciliary body, particularly when used in conjunction with cocaine, has reduced the hæmorrhage in many operations to a minimum. In cataract extraction, especially where the operator confines his incision to the cornea, the operation in many cases is practically bloodless.

Adrenalin has a most beneficial effect in conjunctivitis associated with much itching—a solution of boric acid and biborate of soda grs. 10 to the ounce with a drachm of adrenalin makes an excellent prescription. The prolonged use, however, of adrenalin in the conjunctival sac is not to be recommended.

With regard to the treatment of eye conditions by thryoid the writer has had no practical experience.

Wagner reported a case of neuroretinitis in myxodema in which vision was much improved by the administration of thyroid.

Radcliffe advocated thyroid extract in the various forms of keratitis, beginning with a small dose, one or two (1 or 2) grains three times daily, and carefully watching the constitutional effect. He believes it of great advantage to use early, even in cases where other drugs are properly indicated. Radcliffe holds that it has a dual action, first on the lymphatic system and second in increasing metabolism and nutrition. It undoubtedly increases the lymphatic action as a marked improvement was seen in his cases within the first four days, such a rapid change would hardly be the result of an improved nutrition alone.

In connexion with this treatment it is interesting to note that Fuchs calls attention to the fact that the same complex of symptoms as occurs in tobacco and alcohol amblyopia is met in chronic poisoning by thyroid.

LITERATURE

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SYPHILIS OF THE HEART AND AORTA

By Alexander McPhedran, M.D.,

Toronto

OF the advances in modern medicine few are of more importance than those which have been made in our knowledge of the morbid changes and symptoms caused by syphilis of the vascular system. Syphilis has been known as a cause of aneurism for over two centuries, but it is little more than half a century since it was shown to be a cause of arteritis. In 1856 Sir Samuel Wilks first drew attention to syphilitic affection of the heart, and in 1868 Sir Clifford Allbutt gave the first description of the histological changes of syphilitis of the arteries. The knowledge of the subject increased rapidly, but it was not until the discovery of the *Treponema pallidum* as the infecting organism causing the disease that the great importance of vascular syphilis came to be fully realized. It is probably the most common cause of disease of the arteries, and of the heart it is at least only second to rheumatism. Aneurism occurring before middle life is nearly always due to syphilis, and very often after also, if we exclude the later years of life. In many cases no history of infection, or of symptoms due to it can be obtained. It is of great importance to be fully alive to this possibility in all cases, even in those with a history of rheumatism. The Wassermann test may settle the matter. If there is syphilis in other structures, or the existence of disease at least frequently due to syphilis, such as tabes dorsalis, the syphilitic nature of the cardiac or arterial disease may usually be taken for granted.

Syphilis of the heart shows itself as gummata and arteritis, the latter much most frequently. Gummata form chiefly in the wall of the left ventricle and the interventricular septum. Around the gummata and in the tissue supplied by the affected branches of the coronary arteries varying degrees of myocarditis occur; probably the changes are degenerative rather than inflammatory and due to the diminution in the blood supply owing to the sclerosis of the arteries. Fibrosis follows in any case. The aortic valves are

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frequently affected and may show marked thickening, and deformity.

In congenital syphilis, myocarditis appears from recent investigations to be of frequent occurrence. Dr. Alfred Scott Warthin has described a striking series of twenty-two cases. (*Trans. Assoc. Amer. Physicians*, vol. xxv., page 580). In several cases there was sudden death. There may be no signs or symptoms to indicate the heart disease, and no evidences of syphilitic infection may be found elsewhere at autopsy. In young infants there was found diffuse interstitial myocarditis containing many spirochætes. In some the diseased condition was evident only on careful microscopic examination. In those surviving, other infections of the heart may occur and coronary sclerosis follow later. Various forms of maldevelopment may be associated with the condition. In one case, the oldest, the father, was far advanced in tabes dorsalis.

The aorta in common with the cerebral and coronary arteries is very liable to luetic infection. Its resistance to the infection is low, probably because of the strain of arterial pressure and its rich vascular supply by which it is invaded by many spirochetes. Only in a minority of cases have there been recognized symptoms of syphilis and usually no history of infection, therefore there has been little if any treatment as a rule. Infection of the aorta may occur at any time, even within a few months after the initial lesion, and early prove fatal from rupture of an aneurism. Some writers believe that the infection of the aorta probably occurs in most cases within the first year. This is not to be wondered at, seeing that the organism is borne by the blood stream to which it gains access early after the primary infection.

The infection of the aorta apparently always begins about the terminals of the vasa vasorum in the middle coat, and extends thence to the internal and external coats and often to the periarterial tissue in which possibly gummata always have their origin.

The lesions in the aorta are usually quite characteristic, consisting in the early stage of gelatinous-looking plaques or patches on the inner surface caused by infiltration and thickening of the intima. These may be confined to the immediate neighbourhood of the root; but they may be found also in any part of the aorta and larger vessels. Later they become pale or of a bluish tint and show fibrous-looking depressions of various sizes and shapes, often with linear and irregular contracted scars. On section they are always found associated with disease of the overlying middle and external coats, in which there is infiltration about the vasa vasorum, whose walls, both arterial and venous, show marked sclerosis. In these infiltrated areas giant cells are found; these areas are in fact commencing gummata. The elastic tissue is destroyed quite early and replaced by this gummatous formation. In many cases the spirochætes are found in these areas. These changes weaken the wall of the artery and constitute the first step in the production of aneurism.

Aortitis occurs also in children who have congenital lues, the anatomical changes resulting being identical with those in the adult (*Amer. Jour. Med. Sci.*, March, 1915, 450).

Symptoms: Syphilitic lesions of the heart and aorta produce symptoms identical with those arising from lesions in the same parts from other causes. The invasion of the auriculo-ventricular bundle by a gumma, or fibrosis secondary to coronary arteritis, is probably the most frequent cause of heart-block. Præcordial distress is common, and so is angina pectoris in cases in which there is sclerosis of the aorta and heart.

These symptoms occurring in early life without a history of rheumatism are indicative of syphilis, especially if the heart is not enlarged and the blood pressure not increased. The Wassermann test may confirm the diagnosis.

Aneurism of the aorta in early life owes its origin in nearly all cases to syphilis; even in later life it is frequently the cause. The aneurism is usually latent in the early stages. Later, pressure symptoms are common, such as pain in the distribution of one or more intercostal nerves, often for a long period and of variable intensity, an increased area of dullness, uniformity of the second heart sound all over the surface of the aneurism which is in contact with the chest wall, first irritation and later paralysis of a vocal cord, etc. The fluoroscope may show the shadow of the mass which may be seen in some cases to pulsate slightly. Even small aneurisms may produce dangerous pressure effects. Such was the case of a young negro girl reported by Winternitz (*Johns Hospital Bulletin*, 1913, vol. xxiv, 212); a small aneurism at the root of the aorta caused sudden closure of a coronary artery proving fatal within twenty-four hours.

Treatment: Next to prophylaxis early, vigorous and persistent treatment is of the greatest importance. Such treatment should cure every case. It is important to keep before our minds that the disease is caused by an infecting organism, the *Treponema* or *spirochæta pallidum,* and that it can be destroyed in the blood and tissues by *mercury*, and by *arsenic* given in the form of *diarsenol*. The treatment should be continued until we are assured the organisms are all destroyed as shown by the Wassermann test. Even after the test gives no reaction the treatment should be continued for several months less vigorously, with gradually lengthening intervals between the courses, and the test applied at intervals to ensure the continued absence of the reaction. At the same time the general health should be maintained in the best possible condition. If such a course were pursued in every case there would be in time no syphilis nor cardio-vascular disease arising from it. The fact should also be emphasized that iodides in any form have no effect on the virus of syphilis; they only affect the exudate arising from it; in this respect they are of great benefit, even in the early stages.

After the later signs of the disease manifest themselves the same course of treatment should be carried out and with the greatest possible efficiency. With the giving of mercury and diarsenol to destroy the spirochæte, and iodide of soda or potash to promote absorption of any exudate that may have formed, the outlook in earlier cases is good, and even in late cases it is not hopeless; there will be improvement in most of the latter and they may be restored to live a comfortable and useful life.

The prophylaxis of the disease does not come within the scope of this paper. It is a matter of the greatest importance to the public health of the country as the number of the infected is increasing rapidly. Many of the immigrants are infected and many of their children show the evidences of the disease. Those people are a grave menace to the communities in which they settle. They constitute a considerable proportion of our hospital population, especially in the larger cities, and are therefore a great burden on our charitable funds. The matter calls for action by the government, as it is quite as important that those infected with syphilis, as with tuberculosis, be excluded from the country.

EXPERIMENTAL GASTRO-ENTEROSTOMY*

By F. A. C. Scrimger, B.A., M.D.

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and

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ONE year ago I had the honour of presenting before this section of the Canadian Medical Association the results of some experiments dealing largely with the position of the stoma in a gastro-enterostomy in relation to its mechanical efficiency.

These experiments were carried out by Dr. Archibald and myself in the laboratory of the Department of Experimental Medicine of McGill University.

I take this opportunity of presenting some further studies which have grown out of and which are a continuation of those formerly published (Canadian Medical Association Journal for April, 1914). In these we found, as have many others, that if the opening were placed in the cardiac portion of the stomach, proximal to the beginning of active peristalsis, the food passed freely through the pylorus and not by the stoma; that the nearer to the normal outlet the more efficient was the stoma, whether the pylorus was open or closed. We found further, that the closure of the pylorus, when the stoma was placed in the cardiac end, did not materially increase its efficiency. While noting the movements of the stomach in some of these latter cases it was observed that food left the stomach by the artificial opening only during that period of peristalsis when the strong contractions of the pyloric end had wholly or almost wholly obliterated its cavity.

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* Almost all of the practical work of this continuation of the research was done by F. A. C. Scrimger in the Laboratory of Experimental Medicine, McGill University.

Read by Dr. Scrimger at the 47th Annual Meeting of the Canadian Medical Association, St. John, N.B., July 7th, 1914.

It appeared to us that the artificial obliteration of this cavity, namely, all that portion of the stomach distal to the stoma, might be mechanically of material assistance in emptying the stomach through the artificial opening placed in this situation. To test this theory has been the main object of the experiments we have to report at this time.

There are, however, one or two points in respect to gastro-enterostomy in the human to which I would like to call your attention.

Our experiments went to show, and it is commonly conceded, that the nearer to the pylorus the stoma is placed, the greater will be its efficiency; yet in all the cases that I have had an opportunity to examine by the *x*-rays in following up the late results of the cases operated on in the Royal Victoria Hospital where the opening could be clearly defined, it was seen to have been placed in an almost constant position about a finger's length (or three to four inches) from the pylorus. The reason for this is, that in the no-loop operation, the opening cannot be placed in the immediate vicinity of the pylorus without causing tension or kinking.

Secondly, when examining a patient on whom a gastro-enterostomy has been performed before the fluoroscopic screen, while there is very often a first flow of fluid directly through the new opening, the stomach soon fills beyond the stoma, normal peristalsis begins, and the food passes out at more or less regular intervals, partly through the pylorus and partly through the anastomosis. So long as there is food in the stomach an ulcer is not protected from the normal activities of digestion by a gastro-enterostomy of the pylorus is patent.

Coming more directly to the experiments we have to report, the routine was as follows:

An anterior gastro-jejunostomy was done by the ordinary suture method. The opening in the stomach (three to four cm. long) was placed well towards the fundus wholly proximal or nearly so to the beginning of definite peristalsis. This had been shown in the earlier series of experiments to be an area in which the stoma would not function well whether the pylorus were open or closed. The anastomosis was made with the first loop of the jejunum, using as short a loop as possible.

A fascial ligature was then tied, after the method described by Bogoljuboff (the so-called Wilms method) firmly about the stomach immediately distal to the anastomosis, thus excluding, not the pylorus alone, but the whole peristaltic portion. Stay sutures were then put in half an inch above and below the opening and the abdomen closed.

At varying periods after the animal had recovered from the operation the motor function of the stomach was examined by means of the barium meal before the fluoroscopic screen. This was done through the kindness and with the assistance of Dr. Pirie.

By these means the size, shape and position of the stomach were readily determined. Careful note was made of the rate at which the food passed out, and a watch kept for any evidence of peristalsis, and for any appearance of an hour-glass contraction, which would indicate that food was passing through the constricting band. At a later period the abdomen was opened after the animal had been fed, and the passage of the food from the stomach and the character of the peristalsis were observed. The animal was then killed with chloroform and a post-mortem examination made to determine the state of the stoma and the efficiency of the constricting fascial band. In order to place the anastomosis in a known relation to the beginning of peristalsis, it was necessary to find some means of readily setting up contractions when the animal was under the anæsthetic and the stomach empty. This we believe to have found in barium chloride, as it was used by Cannon in his studies of peristalsis of the large bowel and stomach.

We used it in dilutions of 1-20 to 1-1000, painted on the peritoneal surface with a brush, and observed no ill effects either local or general. Barium chloride is, however, an active chemical poison and we have not dared to use or advise its use in the human for this purpose.

In the present series of experiments fourteen animals were used. Of these five died in from three to ten days following the operation, leaving nine in which the experiment was carried to completion. In none of these five could death be attributed to failure of the stoma to act. There was no vomiting during life, nor was any retention of food found at post mortem. Three died during an epidemic of broncho-pneumonia. The post mortem showed this to be the cause of death. Two died from peritonitis, due in one case to the perforation of the stomach by a lead disk put in to mark the site of the anastomosis.

In all fourteen cases the opening was made in the cardiac end of the stomach and a fascial ligature tied tightly around the organ immediately distal to the anastomosis cutting off from the main cavity all of that portion where peristalsis is normally seen.

There are three points brought out in this series of experiments to which I would like to refer. The first is the behaviour of the fascial band used to tie off the stomach at the desired point. It was adopted as a convenient, easy method which added little to the shock of the operation or the time required to carry it out.

In all but three cases out of the thirty-four animals in which it was employed in this and other series it was clinically successful. No food was seen to pass the ligature either under the fluoroscope or with the abdomen open, even when the rest of the stomach was distended with its contents.

In one case the ligature slipped entirely. In two it allowed small quantities of material to pass through into the pyloric portion of the stomach and so on by the pylorus into the duodenum. At the same time I acknowledge that at post mortem when the stomach wall was relaxed it was always possible to pass a probe or even up to a No. 12F catheter through the ligated area. I believe that the fascial ligature should be actually tied and then sutured in place, as was done by the original investigators.

The second point is in regard to the value of solutions of barium chloride to indicate the area of peristaltic contractions while the animal was under an anæsthetic and the stomach empty. This suggestion was taken from Cannon's work on the movements of the intestines, particularly the large bowel.

We used it in dilutions of from 1-1000 to 1-20, painted on the peritoneal surface with a small brush. We have observations of its effect in producing contractions of the stomach in eleven animals.

It was possible in each case to determine the point at which peristalsis began. This was found to be almost constant for the animal employed and corresponded fairly accurately to that point at which peristalsis was seen to begin under the normal stimulus of food before the fluoroscopic screen. With the higher dilutions 1-1000 and 1-500 rings of contraction could always be made to appear at the point of application, that at the cardiac end being shallow and constant; those at or towards the pylorus deeper and showing what Cannon describes as pulsations, a rhythmic tightening and relaxation of the contracting ring. In three cases the 1-1000 solution was sufficient to set up typical rhythmic peristalsis taking origin from a ring situated half an inch to the cardiac side of a point at the junction of the vertical and transverse portions of the stomach. Proximal to this area, that is, on the side of the cardiac portion, a progressive wave of contraction could not be produced even with solutions as strong as 1-20. In one case a solution of 1-500, and in seven one of 1-100 were necessary before this distinction into an area of tonic contraction and an area of peristaltic contraction could be made. It would seem to us that this agent may prove of value in determining the point at which an anastomosis should be made in human cases. We hesitate, however, to suggest its use until more specific tests have been carried out with regard to its possible toxic action. In none of our animals could death be ascribed to its use, nor was any harmful effect locally on the peritoneum noted.

The third and main point in these experiments is the effect that the placing of the fascial ligature immediately distal to the anastomosis has on its mechanical efficiency.

The opening in the stomach was made in each case just proximal to or at the beginning of the area of peristalsis as shown by the barium chloride. The size of the stoma was from 2·5 to 3 cm. long. Previous experiments had shown that when placed in this position the stoma would not function well whether the pylorus were open or closed. Fourteen animals were used, two dogs and twelve cats. In nine of these only was the experiment carried to completion.

Of the nine animals in which the complete experiment was carried out, all took food well after the first few days after the operation. In two only was it noted that they took less food at a time than previously. All remained in good health and temper; and lived a normal life in the animal house.

Under the fluoroscope with the barium meal the stomach appeared of usual size, moderately well filled. The outline was regular. Peristalsis was recognized in six cases. It was of shallow type and only rarely could the discharge of food through the anastomosis be seen to be synchronous with the wave of contraction. In seven animals all the evidence tended to show that the food was leaving the stomach wholly by the stoma; in two, small quantities were seen to pass through the ligated area into the pyloric portion and on into the duodenum through the pylorus. Even in these the main mass of food went through the stoma. The anastomotic opening was seen at the moment of food passing through in only four cases. In these the shadow ended abruptly just beyond. In others the absence of hour-glass contraction was interpreted as showing that no food was entering the cut-off pyloric portion through the constricting ligature. The stomach emptied in varying times, in one at the end of two hours. Most of the animals showed that a considerable quantity had passed at the end of this time.

It was not easy to fix accurately the times of emptying, nor indeed to fix a normal for the cat. Some food was found in the stomach not infrequently six to eight hours after feeding in normal animals. It seems to depend largely on the quantity and character of the food taken.

The food given was porridge and milk with a small quantity of barium sulphate. The animals were examined from ten days to eight weeks after operation, and sometimes on two or three separate occasions.

At later periods varying from three to ten weeks after operation the animals were anæsthetized, the abdomen reopened and the passage of the food from the stomach observed. Semisolid food, usually ground-up meat and milk, had been given one hour previously. Here again the barium chloride was of great assistance in that we were able to stimulate at will the muscular activity of the stomach.

An interesting series of observations were made in this connection. We had believed from earlier studies that peristaltic activity was confined to the pyloric region, or that there was a well-defined peristaltic area and an area of tonic contraction distinct from each other, and permanently so. This would seem not to be the case. Peristaltic activity could now be set up in six of the nine cases to the cardiac side of the constricting ligature, in a region where it previously could not be induced. In three of the nine the type of contraction remained as before, a ring of contraction formed, but no progressive wave. The peristalsis in the six cases was, however, of a modified nature. The waves were broad and shallow; they began high up on the cardiac end, in two cases within an inch of the œsophageal opening. They spread not so much like an advancing furrow as in the way of a broadening of the original ring to include more and more of the stomach wall up to the constricting ligature Sometimes the wave passed over to the cut off pyloric portion, and caused a slight contraction. It could not be considered that this modified peristalsis could do more than raise the general intragastric pressure; at least, the increase of pressure in front of the advancing wave was evidently small. It would appear from these observations that the area of peristaltic activity under abnormal circumstances, such as these, may not be confined to the pyloric end of the stomach. The waves were not so deep nor so powerful as those usually seen in the pyloric region, but were sufficient to indicate that the stomach had adapted itself to some extent to the new conditions, and was tending to form a new antrum in front of the fascial ligature which now offered the resistance normally met with at the pylorus. The same observation has been made by radiographers occasionally in the course of examining patients who presented, after gastro-enterostomy, conditions analogous to those of the animals in this research. The portion of the stomach between the ligature and the pylorus was always found empty, and contracted to the normal size of the empty stomach, even when the rest of the stomach was distended with food. No food was seen to pass through the ligature. The fluid part of the contents escaped from the stoma at irregular intervals in small quantities. These discharges were frequently associated with the contractions of the stomach already described.

After the passage of food had been watched for one or two hours a post-mortem examination was made to determine the condition of the stoma and the degree of occlusion of the stomach by the fascial ligature.

These observations tend strongly to support the view that an artificial opening made in the cardiac portion of the stomach, the area of tonic contraction, can be made mechanically efficient if the stomach is tied off immediately distal to the opening; while an opening in the same area, if the food is allowed to enter the pyloric region, whether the pylorus is closed or open, will not function well. I do not wish to be understood to mean that we recommend the placing of the anastomosis in the cardiac end of the stomach. On the contrary all our experiments go to show that it should be placed as near the normal opening as is found possible without departing from the principle of the no-loop operation. But we would suggest that in those cases in which it seems wise to occlude the pylorus, the occlusion should be made immediately distal to the anastomosis wherever this has been placed. We believe that this would mean practically a stoma three to four inches from the pylorus, and the tieing off by the fascial ligature of between two and three inches of the pyloric end of the stomach.

A RÉSUMÉ OF THE EVENING CLINIC FOR DIAGNOSIS OF DISEASES OF THE CHEST AT THE BOSTON CITY HOSPITAL

By S. W. Ellsworth, M.D.

IT may be difficult for many to realize the brilliant field which the Roentgen ray has opened to the physicians in the study of the internal organs. The possibilities of more accurate determination of the diseases of the chest by means of the Roentgen ray and the assistance such information affords in prognosis and treatment, places a new and greater responsibility upon the internist who is consulted for a definite opinion.

It has been no easy task to convince conservative physicians that the sense of touch, and sound, could be complemented by the more accurate and definite sense of sight into the deeper tissues of the lungs, and that the x-ray may disclose conditions in the living body which were recognized hitherto only at the autopsy. New methods of examination must prove their value before they can be accepted. The x-ray method is no longer on trial, it is established on a firm basis by years of experience in which medical diagnosis has acknowledged the assistance which it has afforded. Laboratory methods have been justly looked upon with suspicion, if they have tended to supplant, or cause neglect of, old, well-tried, and simple diagnostic methods. It is not proposed that Roentgen ray examinations of the chest alone can or should take the place of auscultation and percussion. The x-ray method must, however, be held as a valuable accessory to the routine methods of physical examination; furnishing as it does additional positive or negative findings, it makes possible an earlier and more definite opinion. No medical examination of the chest can now be considered complete which has neglected this assistance.

The greatest medical problem before the physician to-day is the early diagnosis of early pulmonary tuberculosis. A new definition is required for these terms.

Early diagnosis requires that there should be found at once, by the combination of all data obtainable, enough evidence to state positively the existence of tubercular lesions of the lungs, or to free the patient from doubt and fear, if no signs are found and the lungs are clear; or if suspicious conditions are found, to state the *possibility* of existing disease, classify the patient and give him the benefit of the same treatment which is offered so successfully to the positive case.

Tubercular infection in some form occurs with such frequency that it is now recognized as an almost universal condition. The infection may remain quiescent, or light up into an active process when the individual's power of resistance is lowered.

The manifestations of incipient or early tuberculosis, as ordinarily observed, may be very slight or indefinite. The signs on physical examination oftentimes would suggest early involvement of but one apex. Not infrequently x-ray examination shows that the disease has really extended beyond the first stage, and that when one apex is involved, extension to the opposite side is, to some extent, the rule.

Early tuberculosis is that stage preceding the period of cough or expectoration, when constitutional symptoms are indefinite, physical signs suspicious or absent, changes in the lungs demonstrable only by the x-rays, before the patient has infected others, and when recovery is probable.

To help solve this problem of early diagnosis of pulmonary tuberculosis, the Evening Clinic for Precautionary X-ray Examinations was established at the Boston City Hospital, under the direction of Dr. Francis H. Williams, on November 1st, 1912.

The clinic is for diagnosis only, the patient is examined and sent, with a report, to his attending physician or proper institution for advice and treatment. The clinic is free for those who are unable to pay for such special examination at a private office. Two physicians conduct the examinations, which are made as full as possible and recorded on appropriate charts (a sample chart was shown). A complete history is taken, symptoms noted, physical examination made and compared with the results of fluoroscopic tracing and radiographic interpretation. A summary of all data is combined in the diagnosis, affording ready comparison and review. It is this summary of all evidence which we have called x-ray diagnosis.

A trained nurse has been in attendance to prepare women and children for examination, keep the card files, visit patients at their homes to see that they have accepted proper medical care, and to bring in for examination other members suspected or exposed to contact with the tubercular patient; for it is this class of patients in the earliest stage, who have not yet developed symptoms of sufficient severity to lead them to stop work and to seek medical advice, and who are the most difficult to reach and most essential to search out, if the fight to exterminate the disease is to be successful.

The work is educational, and before it can be accepted by the community, must be recognized as of value to the individual.

A second class of patients, and one which for some time will probably be in the majority, comprises those who are sent in by physicians for confirmation of diagnosis, when disease is suspected or its extent not determined by ordinary methods. Another class is from other charitable institutions, which have not yet been provided with equipment and experience necessary for *x*-ray examinations of the chest.

It is not possible to review in detail the many instructive and interesting cases among the first thousand patients examined by this method, nor to describe the technique and interpretation of fluoroscopic and radiographic findings. The most striking fact, however, is the frequency of mistaken diagnosis made by excellent clinicians, and the large number of delayed or uncertain diagnoses, which have permitted patients to pass from the early to the advanced stages unwarned of the danger which threatened. Aneurism, mediastinal glands and tumours, were overlooked or diagnosis made where none was found by the *x*-ray method. Emphysema has often completely disguised the condition of heart and lungs. Pneumothorax, pleurisy with effusion, encysted pleurisy, and central pneumonia in many cases can be determined definitely only by the aid of the *x*-ray.

During the first fourteen months, 1,036 patients were examined for diagnosis, as follows:

Aneurism	11	cases
Cardiac lesions	27	"
Bronchial glands	46	"
Various diagnoses:		
Asthma, pleurisy, empyema, pneumonia, bone disease	34	"
Pulmonary tuberculosis	918	"

In the nine hundred cases which were received with a positive or suspected clinical diagnosis of pulmonary tuberculosis, comparison with the *x*-ray diagnosis was illuminating, as showing the frequency with which not only slight but often extensive and definite lesions are overlooked when auscultation and percussion are alone employed. We note the unreliability of percussion and auscultation in defining the location, the extent and the nature of the lesion, Analysis of the Diagnosis in 918 Cases Examined with Reference to Pulmonary Tuberculosis

Clinical Diagnosis		*X*-ray Diagnosis		
Positive	253	Positive	187	
		Negative	14	
		Suspected	52	
			——	253
Negative	45	Positive	15	
		Negative	24	
		Suspected	5	
		No diagnosis	1	
			——	45
Suspected	620	Positive	351	
		Negative	83	
		Suspected	148	
		No diagnosis	18	
		Deferred	20	
			——	620

and the impossibility of giving a negative diagnosis when the lungs are clear, unless the *x*-ray method is used.

The comparison of the heart outlines on the fluoroscopic tracing and on the radiograph, with the right and left borders, as obtained by percussion, in this series of cases is most convincing of the inaccuracy of the latter method when dealing with a patient with thick chest walls, either a large or a small heart, abnormal bony thorax, emphysema and pleurisy; while, on the other hand, given the normal chest and heart, percussion outlines very frequently conincide with the *x*-ray borders. Percussion accuracy is noticeably improved when methodically checked by *x*-ray examination.

It cannot be claimed that the *x*-ray will clear up any and all doubtful cases, but the percentage of positive diagnoses can be increased by the employment of this method.

Conclusions. 1. Roentgen ray examination as an accessory to older methods enables one to make an earlier diagnosis in many doubtful cases of disease of the chest with an accuracy not obtained heretofore.

2. No examination of the chest is complete without the *x*-ray record of screen and plate.

3. The best results are obtained when the complete examination is made by the clinician.

4. Clinicians can and should equip themselves to employ this method.

Case Reports

SERIES OF UNUSUAL SURGICAL CONDITIONS

By Dr. A. T. Bazin

Case 1. Hour-glass stomach, due to traction of an umbilical hernia. About a year ago I presented to the Society two cases of hour-glass stomach, the one cicatricial, the other spasmodic, due to saddle ulcer over the lesser curvature. The present case demonstrates a third variety.

Mrs. D., aged sixty-five, was admitted to the General Hospital, February 12th, 1915, referred by Dr. N. M. Cooper of Ormstown and giving the following history: Throughout her lifetime she enjoyed exceptional health, but for thirty years has had an umbilical hernia, which has gradually increased in size and for which she could find no comfortable support. Always a hearty eater, no indigestion.

The present illness began in April, 1914, at which time she weighed 307 pounds. Without apparent cause the patient would vomit, usually in the late afternoon or evening, and would feel normal and hungry in the morning. No pain, discomfort or nausea until just before vomiting set in. Attacks recurred about every fortnight, but became increasingly frequent to three or four times per week. She learned to use the stomach tube and had daily lavage; dieted on milk and eggs, etc., and became markedly constipated. Lost flesh rapidly till on admission she weighed 187 pounds, a loss of 120 pounds. In the preceding weeks had also lost strength but continued to do her housework.

On admission: The skin is loose, dry and wrinkled; the abdomen lax and sunken; umbilical hernia present, base four inches in diameter, and projecting about five inches, tympanitic, contents adherent to sac and cannot be reduced. Bowels had not moved for over a week and scybalous masses fill the descending colon.

Myocarditis present. The urine is normal except for presence of large quantities of acetone; in the stools, no occult blood. Blood: erythrocytes 4,700,000, leucocytes 7,600, hæmoglobin 70 per cent.

Read before the Montreal Medico-Chirurgical Society, June 4th, 1915.

Stomach contents: No marked retention (test meal given in the forenoon and patient in bed); free HCl., 65; total acidity, 100; no lactic acid; occult blood positive; a few yeast cells present. Skiagram: Barium sulphate meal shows a definite hour-glass due to traction of greater curvature into neck of hernial sac.

Operation February 19th: Transverse elliptical incision and radical cure of hernia by Mayo's method of reduplication of rectus sheaths. Contents were omentum and large loop of transverse colon all bound together and to the sac by strong bands of adhesions. The greater curvature of the stomach was pulled down to the level of the hernial ring and at this point the gastro-colic omentum showed an area of fibrosis caused by friction against the ring.

Freeing of the adhesions and returning the colon restored the stomach to normal shape. In spite of the tremendous loss of weight the transverse meso-colon was from two to three inches thick with firm fat between its layers through which the duodenal-jejunal flexure was tunnelled.

I will not detail the convalescence; it was an extremely stormy one. Vomiting was a marked feature from the first and due to two causes, namely, acetonæmia, which was combated by daily subcutaneous soda bicarbonate solution, 3 per cent., in large quantities, and dilatation of the stomach due to, I think, obstruction at the duodenal-jejunal junction. When one considers the thickness of firm fat in the transverse meso-colon and that for nearly thirty years this structure had been standing out almost at right angles from its attachment to the posterior abdominal wall and entering the hernia, it is easy to conceive that the sudden alteration in its direction would so squeeze the duodeno-jejunal junction passing through it as to cause obstruction. This cause of vomiting was in turn met by posturing the patient in an inverted position, by stomach lavage and liquid paraffin introduced through the stomach tube. At no time did the bowels give trouble, responding freely to enemata of various kinds. Syncopal attacks were alarming from time to time and on the ninth day a hypostatic pneumonia developed on the left side.

She was discharged March 13th, twenty-two days after operation, being conveyed to her home in the country by ambulance and stretcher. The condition on discharge showed the wound healed and firm. The suture line was fourteen inches long, closed by tension sutures, which were removed on the seventh day and Michel clips removed on the fifth day. She was taking nourishment freely and without discomfort; the urine was normal except for some albumin and pus cells due to cystitis, consequent upon catheterization having been required. Pulse 80, but dyspnœa and orthopnœa on slightest exertion and heart somewhat enlarged.

At the latest report, May 17th, she is able to move about the house and take short walks.

Case 2. Pre-natal volvulus of small intestine.

On October 5th, 1909, a robust female child was born at 8 a.m. after a natural, easy labour on the part of the mother, this being her ninth child. During the first twenty-four hours the child cried lustily and frequently as if in pain; urinated freely but passed no meconium and vomited a greenish fluid several times. In the forenoon of the day following birth, examination showed an evenly distended abdomen with no mass palpable; anal orifice normal and finger passed into anal canal $1\frac{3}{4}$ inches found a capacious bowel cavity the top of which could not be reached; the finger was not stained with meconium. In the afternoon enema given with soft rubber catheter which could be passed four or five inches; enema expelled after three or four ounces had been given. No stool, no flatus, but a large quantity of inspissated opaque white mucus.

On October 6th, operation at 8 p.m., thirty-six hours after birth, chloroform anæsthesia. Anal canal: finger passed into capacious gut which at level of pelvic brim suddenly narrowed to admit only the tip of the little finger. Gut was empty, no meconium stain; no bulging colon to be felt above. Abdominal incision: through left rectus below level of umbilicus. On opening peritoneum a quantity of blood-stained serum escaped and the small bowel presented, this was purplish in colour and distended to $1\frac{1}{2}$ inches in diameter. Neither sigmoid nor cæcum could be palpated. A loop of the distended small bowel was secured and the fingers passed to the mesenteric root which was found to be twisted upon itself. Rapid evisceration was done, which demonstrated that from three to four feet of ileum and jejunum were involved in a volvulus of $1\frac{1}{2}$ turns from left to right. There were no adhesions and the malposition was easily corrected, hot towels being applied to the gut. With the abdomen thus emptied it was seen that the upper part of the small intestine was normal in size, though dark and congested and filled with fluid and gaseous contents. The distended portion of the small gut also contained gas and fluid but towards the lower end the contents became more and more firm and about four inches from the ileo-cæcal valve became scybalous in character. The cæcum and all of the colon were represented by a firm contracted cord about 7 mm. in diameter filled with hard nodules giving it the feeling and appearance of a string of beads.

As no relief was evident an enterostomy was done in a loop of ileum about five inches from the cæcum and a small Paul's tube inserted. The flow of meconium had to be assisted by passing a small catheter along the tube into the gut and washing out with saline. In this way the small intestine was emptied; it regained normal colour and size and it was then possible to return it to the abdominal cavity, the Paul tube being brought out of the original incision, which was closed with through and through silk-worm gut sutures.

On the following day the tube discharged freely; there was only occasional vomiting; water taken by mouth. In the early morning of the 8th and throughout the day the bowels moved naturally per anum; frequent vomiting during the forenoon and early afternoon; some distension of the epigastrium, which lessened towards evening, and vomiting ceased. The child slept most of the time but would not nurse; water with whiskey given. On the 9th stomach distended; lavage followed by improvement. 10th, Paul's tube came away, suture having cut through; stools are lighter in colour; nursing vigorously, no vomiting. On the 11th, no stool per anum, profuse discharge from fistula, sutures cut through and wound gapes; no vomiting, nursing well. 12th, profuse watery discharges from fistula with much partially digested milk. In the evening a severe hæmorrhage from the base of the umbilical cord and the child died, six days after operation, seven and a half days after birth; no autopsy allowed.

Observations and deductions: Usually intestinal obstruction in the new-born results from some form of imperforate anus or maldevelopment of the hind gut. The present case adds to the etiological factors of that condition. The thinned out intestinal wall, as also the abdominal wall, weakened by the distension and macerated by the discharges, led to the early cutting out of the sutures. If I had not acted on the supposition that the inspissated nodules of mucus in the colon would have proved an unsurmountable obstacle to peristalsis and had omitted the use of Paul's tube, contenting myself with a simple enterotomy to empty the intestine followed by suture of intestine and complete closure of the abdominal wall, the outcome might have been different.

Case 3. Double inguinal hernia in a marantic infant.

Baby M., male, aged five and one-half months, referred by Dr. W. M. Fisk, August 22nd, 1913. The child was a seven-months' baby, labour having been induced on account of the suffering and ill health of the mother who had had a ventro-suspension eighteen months before. Weight at birth four pounds. Bottle fed from the start and gained but slowly with considerable digestive disturbance. One month prior to operation these symptoms increased, vomiting occurred after almost every feeding and crying from colic was incessant; the child was rapidly failing. At birth the right inguinal region was prominent but not until the baby was three and a half months old did definite hernia manifest itself, first on the left, later on the right side; a rubber truss was applied which failed to hold the herniæ.

Examination showed both testicles in normal position. The left hernia was reducible; the right reducible except for a narrow elongated mass which remained in the sac and which was tender to pressure, leading to a diagnosis of appendix adherent in the sac.

Operation confirmed these findings, the contents of the left sac being sigmoid and of the right sac the cæcum and appendix; the tip of the appendix was bulbous and firmly adherent to the bottom of the sac.

Recovery from operation was uneventful and there was immediate improvement in the digestive ailment, vomiting was only occasional, colic infrequent and there was steady gain in weight. Unfortunately when one year old the child developed bronchopneumonia which caused its death.

A word as to an important detail in the post-operative treatment of similarly-placed wounds in infants. I apply no dressings and do not allow a diaper to be used. The incision, which is closed with Michel clips, is painted with Tr. Iodine daily until the clips are removed on the fourth day. In this way the wound remains dry and healing is prompt.

Editorial

GASTRIC ULCER AND GASTRIC CANCER

SINCE 1835, when Cruvielhier suggested that possibly there was a relationship of cause and effect, or that of a primary or secondary process between gastric ulcer and cancer, the interest in the subject has been increasing. To-day the view is repeatedly expressed that gastric cancer is often engrafted on an ulcer and a malignant transformation occurs not infrequently on the cicatrix of a healing ulcer.

Notwithstanding the lapse of time which marks the distance between the suggestion and the stout affirmation of a relationship of these common processes in the stomach, during which an increasing number of observers have taken up the question, it is certain that opinions are yet divided and the last word on this important matter has not yet been spoken. More and more, as surgery is able to accomplish with increasing safety so much for the relief of cancer patients, it becomes almost obligatory to operate on patients in whom for well founded reasons a "precancerous" state is discovered. If one may believe that gastric cancer follows gastric ulcer in from 66 to 71 per cent. of instances, as some affirm, and if an early excision of an ulcer or an operation promoting healing, lessens the predisposition to cancer, then the indication for operative interference is clear in all cases of gastric ulcer, as soon as diagnosed, and exploration even in suspected cases.

The arguments that have been advanced for the support of the view of a close relationship are numerous. The theory of chronic irritation as a cause of cancer for which so many illustrations are to hand, e.g., smoker's cancer, Australian cancer, etc., is frequently quoted. It is difficult to see, however, just how this theory can be applied to explain how a cancer follows upon an ulcer. There are but few, we believe, who deny that these processes may have a common cause—an irritating cause. Moreover, the site most common to ulcer is not that most common to cancer, according to Head. Again the histologist points out in many cases that the ulcer is undergoing a cancerous transformation. In the mucosa and submucosa, at the edge of the ulcer, cancer cells are found or a cicatrix of a former ulcer is showing cancerous changes. Perhaps from this source the high percentages arise and before long possibly the most skeptical will be convinced through this observation alone.

Statistics as usual give a varied answer according to the atmosphere, clinical or otherwise, in which they are studied. It is a statement of fact which Hemmeter wrote not long since that physicians are skeptical of the high percentage indicating the relation of these two digestive diseases, as viewed by American and English surgeons; and while admitting that cancer follows ulcer, it does so in a small proportion of cases, varying from three to seven or ten per cent.

Hirschfeld in 1902 comparing the number of ulcer patients (3 per cent.) in the hospitals of Zurich, Munich, and Vienna with those in Berlin, and Hamburg (7 per cent.), showed that where ulcer cases were in excess, cancer cases were not found with corresponding frequency. Friedenwald has reported upon one thousand cases of gastric cancer, only seventy-three of which gave a definite history of former gastric ulcer, while two hundred and thirty-two (23 per cent.) recalled some previous gastric disturbance. Thus 7·3 per cent. were cases of gastric ulcer, and if we regard all those as ulcer patients who had previous gastric disturbance, the percentage falls far below that quoted above.

Billeter, quoted by Hemmeter, observing the surgical cases in Professor Krönlein's clinic, carefully regarded one hundred and sixteen cases that were operated on for ulcer of the stomach. No excisions were done—simply gastro-enterostomies. The patients were observed from four years to twenty-six years. Nineteen patients died, and eighty-seven were still living without any sign of carcinoma. Two patients died of cancer but only one was of secondary cancer. There was a suspicion of cancer in ten at the time of operation. These made a complete recovery. From this group, small indeed, it is seen that less than one per cent. developed cancer—secondary to ulcer.

Hemmeter remarks, "one is not in duty bound to establish as a therapeutic principle the resection of gastric ulcer on account of any subsequent danger from carcinoma." He adds that of two hundred and thirty-two cases of gastric ulcer observed by himself in twenty-five years, but three developed cancer.

As pointed out in the beginning of this note, the last word has not been spoken in this matter. It can come only after more years of close observation and comparison.

A QUESTION OF PRIORITY

IN the *Journal of Obstetrics and Gynæcology of the British Empire* for January, 1915, one finds a "Note on the 'Dublin method' of conducting the third stage of labour," contributed by Dr. T. Percy C. Kirkpatrick. It seems that recently there had come into the hands of the author a fairly well-known pamphlet, new evidently to him, which was issued by John Harvie, a teacher of Midwifery of London, under the title "Practical Directions, showing a method of preserving the perineum in birth, and of delivering the placenta without violence; illustrated by cases."

Dr. Kirkpatrick recalled the fact that another Irishman, Dr. Henry Jewett, had, in May, 1900, before the Obstetric Section of the Royal Academy of Medicine in Ireland, claimed that the method of effecting the delivery of the placenta by external manipulations as opposed to its delivery by traction on the fundus, was originated in Dublin. Dr. Jewett stated that as there was no essential difference between the "Dublin method" and the method first described by Crede in 1853, subsequently known by his name; that therefore the method of expulsion of the placenta by pressure applied to the fundus uteri should be termed the "Dublin method."

The literature on this subject, which was available in 1904 to Prof. A. O. Lindfors of Upsala, was also within reach of Dr. Jewett if he had consulted it before putting forth his claim. In the *Handbuch der Geburtshülfe* of F. von Winckel, Bd. i, Teil ii., Professor Lindfors in a masterly and interesting historical review of the records of our knowledge of the management of the third stage of labour, gives full credit to John Harvie and extensively quotes the latter in English. Professor Lindfors shews that not only was John Harvie the first to recommend careful systematic palpation of the fundus uteri through the abdominal wall during the third stage of labour, but that he also was the first to recognise and record that the shape of the uterus altered with the detachment of the placenta and that he established the fact that external pressure then applied to the fundus was sufficient to bring about the expulsion of the placenta.

Professor Lindfors mentioned that Dease, an Irishman, at the time Master of the Rotunda, in 1783 described a method which was practically the same as that of John Harvie, but doubts whether he had been unaffected by the teaching of the latter.

One may well ask, why qualify or designate the method by the name of a man or of a city? We speak of manual removal of the placenta, why not designate the method under discussion, "the manual expression of the placenta"?

A PORTION of the £50,000 which was transmitted to the British Government by the women of Canada some months ago is now being expended upon an addition to the Royal Naval Hospital at Haslar in the Isle of Wight. The new wing will provide accommodation for 250 beds. It will be built of red brick with stone facings, and will be separate from the main building. The extra accommodation is badly needed, particularly in view of the naval operations in the Dardanelles.

On page 1087 of the *British Medical Journal* for June 26th, an appeal is made by the National Medical Research Committee, for information concerning the results obtained by practitioners who have used the salvarsan products manufactured in England and France. The committee repeats its former statement that it is satisfied that the biological tests applied under its direction proved that the products were not inferior, in safety or in efficacy, to the original German preparations.

The annual meeting of the Medical Library Association took place recently, under the presidency of Lieutenant-Colonel C. C. McCulloch, of the Surgeon-General's office, Washington. The Association has been in existence for eighteen years; the membership is open to any medical society, association, university or college, with a library of a least five hundred volumes and a librarian or other attendant in charge, and to any individual interested in medical literature in libraries. The fee is $10 library membership and $5 individual membership. At present there are fifty-two library members and 46 individual members. The Secretary-treasurer of the Association is Dr. John Ruhräh, 1211 Cathedral Street, Baltimore, Maryland.

The sum of £145,000 is included in the Civil Service estimates to cover grants which the British government proposes to make to universities, colleges, and similar institutions which are in receipt of parliamentary grants and which have been adversely affected by the war by the loss of fee income arising from the widespread response among men students to the call for recruits.

An interesting account of hospitals and medical education in China is found in the Report of the China Medical Commission, appointed by the Rockefeller Foundation, New York, a summary of which appeared in the June number of the *Bulletin of the Johns Hopkins Hospital*. The death rate in China is extremely high, as may well be imagined. Tuberculosis, hookworm disease, syphilis, leprosy and smallpox are among the diseases most frequently met with, and "patent" medicines enjoy an unrestricted vogue. Chinese doctors know nothing of anatomy or surgery, and it was only on November 22nd, 1913, that dissections and *post mortem* examinations were officially authorized. The Chinese physicians who have been trained in the Western Schools, usually are attached to mission hospitals. The Chinese schools are poorly equipped and inadequately staffed and the Commission found that a study of the hospitals virtually amounted to a consideration of the mission hospital, as other hospitals established by foreigners are intended for the care of such foreigners and have little direct influence on China itself.

The following resolutions were passed at a meeting of the Union of Municipalities Convention, which took place at Humboldt, Saskatchewan, on June 24th. That the government be asked to increase the grants paid to hospitals for treatment of infectious cases. That in view of the necessity of hospital accommodation being provided to all persons and the difficulty of obtaining collections and the constant trouble to run hospitals partly maintained by charitable contributions, it is desirable that the Provincial Government should authorise a co-operative system of hospital accommodation by the union of urban and rural municipalities for the erection and entire maintenance of hospitals for all patients in their districts, and with this view that a capital fund be divided between the several municipalities according to their size or rateable value. That the entire cost of maintenance be met by the payment of all patients' bills of persons residing within the respective municipalities by the respective municipalities. It has been found that the cost of maintenance rarely exceeds $1.00 per quarter-section and often less, and this provides accommodation for the farmer, his family and hired help.

THE eighth annual report of the British Columbia Antituberculosis Society states that, during 1914, 180 patients received treatment at the King Edward Sanatorium at Tranquille. During the year in question, 91 patients were admitted to the sanatorium; these latter were classified on admission as, incipient, 14·3 per cent., moderately advanced, 28·6 per cent.; far advanced, 54·9 per cent., and non-tubercular, 2·2 per cent. The percentage discharged with the disease arrested or quiescent was, incipient, 71·4, moderately advanced, 54·5, advanced, 21·5. The percentage of those discharged improved was 23·7, and 34·2 per cent. died. Five patients, who on admission were suffering from acute tuberculosis, died within seven weeks. The treatment given consisted of rest in the fresh air, good food, and carefully graded exercise. Artificial pneumothorax was tried in fourteen selected cases, in eight of which a good pneumothorax was produced; in four cases the procedure was partially successful but the patients derived no benefit as but little compression of lung could be effected on account of adhesions. One case refused to continue the treatment and in another it was impossible to find pleural space because of adhesions. In three cases complications developed. Autogenous vaccines were tried in a few cases, and tuberculin was administered in other selected cases. The conclusion drawn from the results of these modes of treatment is that "while tuberculin, vaccines, and pneumothorax are valuable aids in suitable cases, the mainstay of the treatment must be rest in the fresh air, and when active signs of the disease have subsided, carefully graded exercise." Unfortunately, during the year it has been necessary to refuse admission to many applicants owing to lack of accommodation.

The hospital commission, recently appointed by Order-in-Council, held its first meeting July 20th at the militia headquarters. The president, the Honourable Senator Lougheed, presided, and the following members of the commission attended: Colonel Sir H. M. Pellatt, Toronto; Mr. Smeaton White, Montreal; Mr. John S. McLennan, Sydney; Lieutenant-Colonel Thomas Walker, St. John, New Brunswick; Mr. F. W. Avery, Ottawa; Mr. C. B. Smith, Montreal, and the acting director-general of medical services, Major Potter. The deputy-minister of Militia, Surgeon-General Fiset, Lieutenant-Colonel Maunisell, Ottawa, and Lieutenant Colonel Delaney, Quebec, were also present.

The president outlined the objects of the commission and its general scope was fully discussed. The commission has under consideration a large number of offers of private houses and other buildings for the purpose of convalescent homes. The secretary was directed to communicate with all who had made offers, to convey to them the thanks of the commission and to explain that owing to the uncertainty as to the number of invalided soldiers at present on their way from Europe, many of these places which are eminently suitable cannot at the moment be accepted.

Arrangements are being made to utilize part of the immigration building at Quebec as a distributing hospital. This building recently erected by the Dominion government, is admirably adapted for this purpose. It was decided to recommend that the benefits of the convalescent homes should be extended to invalided members of the Canadian expeditionary force who have not left for Europe.

The secretary was instructed to convey to the St. John Ambulance Association, the Red Cross Society and other voluntary organizations the thanks of the commission for their offers of services, which will be utilized whenever possible. Mr. H. Scammell, assistant censor at military headquarters, was appointed secretary. The offices of the commission will be at 22 Victoria Street, Ottawa. The next meeting of the commission will be held at Quebec.

The inventive genius of our time has been employed largely in devising destructive measures: the great guns with their infernal shells, the æroplane, and the torpedo are used to destroy human life; preventive medicine and sanitation are ranged on the other side. The comparatively small number of cases of such destructive diseases as enteric and typhoid fever among the troops engaged in the present war shows how much has been done to preserve life. The mosquito has been conquered but a way of destroying the house fly is still to be discovered. In spite of lectures on the means of preventing the breeding of these insects the trenches are filled with millions of bluebottles and house-flies; they infest every corner, they cover every morsel of food, and settle with avidity upon the soldier sleeping in the dug-out and upon his wounded comrade. The distress thus caused can well be imagined, let alone the danger of an epidemic. To quote from a letter recently published in a daily paper: "If someone were to devise a means of ridding our men at the front of the millions of noisome flies which are pestering them these hot summer days he would earn the thanks of all the army."

The College of Physicians and Surgeons of the Province of Saskatchewan decided at a recent meeting to discontinue the provincial medical examinations after December next in favour of the examinations of the Dominion Medical Council. The decision is an important one; it is a step further towards the establishment of a common standard of medical education. Saskatchewan is the first province to take such action and is to be congratulated upon the example thus set. Possibly the day is not far distant when there will be in the Dominion but one medical council, one national standard of medical education, and a general freedom to practise throughout the country.

Book Reviews

MEDICAL ELECTRICITY, ROENTGEN RAYS AND RADIUM, WITH A PRACTICAL CHAPTER ON PHOTOTHERAPY. By SINCLAIR TOUSEY. Second edition, thoroughly revised and greatly enlarged. Philadelphia and London, W. B. Saunders, 1915. Canadian agents, J. F. Hartz Company, Limited, Toronto. Price, cloth, $7.50 net; half morocco, $9.00 net.

This work is much more than a treatise on electro-therapeutics; it deals not only with this subject and with Röntgen rays, as the title implies, but also with such subjects as phototherapy, electricity occurring in animals and plants, the physiological effects of electricity on micro-organisms and on vertebrates, the pathological effects of electric tissues on the currents, and the use of radium.

Static electricity is first considered and the different methods of applying this form of electricity are made clear by means of simple diagrams. Dynamic electricity in its various forms is fully discussed and well illustrated by many diagrams. The mathematical side of the question is by no means forgotten and many formulæ for exact measurement of currents and expected results are given. Electrodiagnosis is taken up at some length and all the important points in the diagnostic and prognostic value of electricity seem to be at least mentioned.

The use of electricity in diseases of the nervous system is well covered and much information given. The author treats the subject conservatively and makes no extravagant claims. The *x*-ray, its theory and practice takes up almost five hundred pages of the book, and here, in addition to diagrams and radiograms, there are several colored plates of *x*-ray tubes in operation in conditions that diminish their efficiency. An interesting part of the subject of radiography that is fully discussed, and in which many convincing radiograms are shewn, is the use of the *x*-ray in dentistry. This is done by means of the author's fluoroscope, or, better by cinematograph film held in mouth by means of an aluminium film-carrier which the author has devised. A wider use of these methods would seem to be a distinct advance, and would give the dentist a much more exact knowledge of the condition of the teeth than he can possibly have by the older and more frequently used methods.

A few misprints are noticeable, but, so far as seen, these are so obvious as to lead to little confusion.

MENTALLY DEFECTIVE CHILDREN. By ALFRED BINET and TH. SIMON, M.D. Authorized translation by W. B. DRUMMOND, M.B., C.M., F.R.C.P., with appendix containing the Binet-Simon tests of intelligence by MARGARET DRUMMOND and an introduction by PROFESSOR A. DARROCH. Price, 2s. 6d. London: Edward Arnold, 1914.

As Professor Darroch says in his introduction the Binet-Simon tests of children's intelligence have been the subject of much discussion during the past few years, both in England and in America. These tests have been used and are being used in every Juvenile Court which has a physician attached to it, and in all the schools for feeble-minded children. The tests, although admitted not to be absolutely correct, have furnished proof that the question of feeble-mindedness on this continent is a serious one and one which the State will soon have to face. In this small volume, Binet and Simon, in a very clear manner, discuss the psychology of a child, how to grapple with the problem of feeble-minded and backward children in schools, the method of distinguishing these children from normal ones, and the best method of treating them. For those who are interested in the problems of mental deficiency this book is indispensable.

SURGICAL SHOCK. ANOCI-ASSOCIATION. By GEORGE W. CRILE, M.D., and WILLIAM E. LOWER, M.D. Edited by AMY F. ROWLAND. W. B. Saunders Co., Philadelphia and London, 1914.

This work is a good piece of book-making in the good and bad senses of the phrase. Its get up is admirable: clear print on heavy (perhaps too heavy) paper, with excellent illustrations and plain, good binding. Its main thesis is that the prevention of shock is the beginning of surgery. To obtain a theory of shock, its causes and seat of action must be known. If we assume that fatigue or exhaustion of certain organs in the body is the result of shock, a histological survey of the tissues of a shocked organism will throw light on the problem. Such a survey has been made by Dr. Crile and his co-workers and they find that after producing shock by anæsthesia, by trauma, by the injection of drugs, by physical exhaustion and insomnia, or by fear, the organs that suffer are the central nervous system, the liver and the suprarenals. After such shock the cells of the cortex of the brain and the cerebellum show marked chromatolysis, and the cells of the liver and suprarenal "degenerative" changes. If, by surgical technique, both in the ward and on the operating table, we can obviate these changes, then, the above assumption being true, we can do away with surgical shock.

Of the anæsthetics, nitrous-oxide with oxygen has the least effect on the tissues, ether is next, and last is chloroform. The effects of trauma on the tissues are abolished if we block the nerve impulses from the seat of the trauma on their way in to the central nervous system. Of the drugs strychnine produces similar effects to those of trauma, while morphine protects the body from shock. Therefore, Dr. Crile adopts into his technique the use of nitrous-oxide as anæsthetic, with the addition of a little ether in difficult cases. Morphine and scopolamin are used preoperatively to produce a calm and comfortable state of mind in the patient. Fear of the operation is obviated partly by these drugs and also by the reassuring attitude of the surgeons and nurses before the operation. During the operation the stimulation of pain developing (noci-cipient) nerve-endings is avoided by sharp (and not tearing) dissection, and by blocking the paths of those noci-cipient fibres that must be disturbed with novocain. (These noci-cipient endings and fibres are mainly distributed to the skin, fasciæ of muscles, etc.—parts of the body that have in phylogeny and ontogeny come into violent contact with environment). And finally the shock-producing effects of post-operative pain that are unavoidable even in spite of the above technique, are obviated by blocking the pain end organs at some distance from the wound by a lasting local anæsthetic (urea hydrochloride and quinine). By these means, it is claimed, the symptoms of surgical shock are abolished, and the statistics quoted in the book bear out this claim. Undoubtedly the idea at the back of the work is plausible, based as it is on Sherrington's admirable work on the central nervous system, the work of Cannon and T. R. Elliott on the suprarenal bodies, and MacLeod's work on the glycogenic function of the liver. Dr. Crile's theories and technique are worthy the sincere and scientific attention of the practising surgeon.

There is a necessary change, if we accept Dr. Crile's work, in views concerning the seat of action of the anæsthetic. It thrusts its wedge, not between lower and higher brain centres as usually imagined, for under anæsthetic the cortical cells are still assailable by noci-cipient impulses, but between these cells and the effect or organ (muscle or gland) and also between these cells and consciousness. Such a change in standpoint is easily put to the test of experiment and has been so put by Dr. Crile and his colleagues.

Perhaps the reason that Dr. Crile's technique has not been more widely accepted is that the arguments for it have been too plausible, too *facile*, and that his theories have been too ardently advertised by admiring disciples. The world, even the scientific world, too easily suspects the sincerity of a clever mind.

LECONS SUR LA LILHIASE BILIAIRE. Par A. CHAUFFARD avec 20 planches hors texte. Masson et Cie Editeurs, Libraires. De l'académie de Médecine. 120 Boulevard Saint-Germain. Paris, 1914.

It was in 1911 that M. Chauffard succeeded Professor Hayem in the chair of medicine at the St. Antoine Hospital; and during the winter and spring he gave a series of lectures on cholelithiasis. These have now appeared in book form together with his inaugural address. Chauffard has many of the qualities of an orator, and though as a writer his style is good, the reader misses much that the listener carries away. Our knowledge of the pathogenicity of this morbid state has been increased by the brilliant researches of the author over a period of many years. Cholelithiasis is much more frequent in the woman than in the man; pregnancy plays an important rôle in the production of this disease; and it is the hypercholesteræmia, genital in origin, that is the cause of this pathological condition. Heredity as a factor he minimizes; and he does not believe that typhoid fever has the æteological significance that it is commonly credited with. His researches lead him to conclude that cholelithiasis is always accompanied by hypercholesteræmia; and that the Vichy cure causes a decrease of the cholesterine in the blood to within normal limits. Cholesterine is normally excreted by the liver, and it is a functional disturbance of the hepatic cells that brings about a retention of this substance in the blood, and a diminution in the bile passages, with a consequent formation of gall stones.

Pain, its cause, topographical distribution and diagnostic value, occupies two chapters. The last three lectures are given to treatment; dietetic, medicinal, hydromineral, and surgical. These chapters are presented in a form characteristic of the French school of medicine, and are of value to the practitioner.

TEXT-BOOK OF THE PRACTICE OF MEDICINE. FOR STUDENTS AND PRACTITIONERS. By H. A. HARE, B.Sc., M.D. Third edition, revised and enlarged. Philadelphia and New York, Lea and Febiger, 1915. Price, cloth, $6.00 net.

The third edition of this well-known text-book of medicine has appeared. The text has been carefully revised, some of the articles have been rewritten, much that is new has been added. It is a well bound book of 967 pages with 142 engravings and 16 plates in colours and monochrome. The salient features of the book are the easy style of the writer, the good illustrations, the few typographical errors, and well arranged table of contents and index. Many of the diseases, in spite of the limitations which a text-book requires, are described with a thoroughness of detail and completeness of form that will be appreciated by the student and practitioner. The article on typhoid fever will be found most helpful, so too the chapter on diabetes. Diseases of the circulation occupy seventy pages. It would have been well here if the author had given a classification of the arrhythmias and had made some mention of the Einthoven string galvanometer, and its value in the clinical examination of heart affections. In the chapter on diseases of the kidneys not sufficient importance is given to a salt free diet in the treatment of nephritis with œdema; and too little attention is paid to the prognostic value of the quantitative estimation of urea in the blood. The importance of venesection in uræmia should have been emphasized, and something more might have been said about hypertension in cardio-renal disease. The book can be recommended as an addition to the student's or practitioner's working library.

STUDENTS' MANUAL OF GYNECOLOGY. By JOHN OSBORN POLAK, M.Sc., M.D., F.A.C.S., Professor of Obstetrics and Gynecology, Long Island College Hospital. 12mo, 414 pages, illustrated with 100 engravings and 9 colored plates. Cloth, $3.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

This manual of gynæcology by Dr. John Osborn Polak has been written with a view to being used both by undergraduates and by general practitioners following graduate courses. It is a well-written work of about 400 pages and is especially to be commended to those taking post-graduate courses. As is to be expected from the author, the operative treatment of lacerations of the pelvic floor, cystocele, and prolapse are very clearly outlined. Among the predisposing causes of prolapse great stress is laid on the frequent improper management of the puerperium during which the patient is kept unnecessarily long on her back and provided with a tight abdominal binder. Also the importance of medical supervision till the pelvic organs are proven once more normal in size and position. The technique of performing anterior colporrhaphy for the cure of cystocele is fully described and could be read with benefit by all, as in this operation many fail for lack of thoroughness. Some might question the statement that the treatment of acute septic endometritis is one solely of "intelligent inactivity" and that in such cases "the uterine content is left undisturbed, to be separated and dispelled by uterine contraction unless there is active hæmorrhage." Certainly no harm can be done by the gentle digital removal of placental masses. The chapter on gynæcological diagnosis is especially well written. Throughout the work the important points in symptomatology, diagnosis and treatment have been italicized so that the reader can recognize the salient facts immediately.

The following candidates passed the examinations of the Medical Council of Canada recently held at Winnipeg: F. A. Benner, Aylmer, Ontario; E. Bice, Clandeboy, Ontario; J. T. W. Boyd, Port Arthur, Ontario; W. L. Evans, St. Mary's, Ontario; G. Fenton, Big River, Saskatchewan; R. H. Fraser, Chatham, Ontario; J. Gemmill, Winnipeg; C. A. Graves, Mascett, British Columbia; H. J. Harris, Toronto; H. W. Hill, London, Ontario; J. B. Hirshberg, Bay City, Michigan; A. F. Laird, Winnipeg; G. A. Lamont, Guelph, Ontario; J. R. MacPherson, Toronto; J. Moriarty, Orillia, Ontario; H. W. Morley, Dauphin, Manitoba; H. R. Mustard, Victoria, British Columbia; T. J. Simpson, Waldemar, Ontario; P. P. Smyth, Toronto; C. W. Waas, Winnipeg; C. E. Walsh, Port Maitland, Nova Scotia.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been recieved.

ALVEOLODENTAL PYORRHEA. By CHARLES C. BASS, professor of experimental medicine at the Tulane Medical College, and FOSTER M. JOHNS, instructor in the laboratories of clinical medicine at the Tulane Medical College. W. B. Saunders, Philadelphia and London, 1915. Price, $2.00 net. Sole Canadian agents: J. F. Hartz Company, Ltd., Toronto.

AMŒBIASES AND THE DYSENTERIES. By LLEWELLYN POWELL PHILLIPS, M.A., M.D., B.C. (Cantab.), F.R.C.P. (Lond.), F.R.C.S. (England). H. K. Lewis, London, 1915. Price 6s. 6d. net.

COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINNESOTA. Edited by MRS. M. E. MELLISH. Volume VI. W. B. Saunders, Philadelphia and London, 1915. Price, cloth, $5.50 net. Half morocco, $7.00 net.

THE COMMONER DISEASES, THEIR CAUSES AND EFFECTS. By DR. LEONHARD JORES, O.O., Professor der allgemeinen Pathologie an der Universität Marburg. Authorized English translation by WILLIAM H. WOGLOM, assistant professor in Columbia University. J. B. Lippincott Company, Philadelphia, 1915. Price, $4.00 net.

DIARRHÆAL, INFLAMMATORY, OBSTRUCTIVE AND PARASITIC DISEASES OF THE GASTRO-INTESTINAL TRACT. By SAMUEL GOODWIN GANT, M.D., LL.D., professor of diseases of the colon, sigmoid flexure, rectum and anus, New York Post-Graduate Medical School and Hospital. W. B. Saunders, Philadelphia and London, 1915. Price, cloth, $6.00 net, half morocco, $7.50 net. Sole Canadian agents, J. F. Hartz Company, Ltd., Toronto.

DIABETES MELLITUS. Designed for the use of practitioners of medicine. By NELLIS B. FOSTER, M.D., assistant professor of medicine, Cornell University. J. B. Lippincott Company, 1915. Price, $3.00 net.

DISEASES OF THE DIGESTIVE ORGANS, WITH SPECIAL REFERENCE TO THEIR DIAGNOSIS AND TREATMENT. By CHARLES D. AARON, Sc.D., M.D., professor of gastro-enterology in the Detroit College of medicine and surgery; consulting Gastro-enterologist to Harper Hospital. Lea and Febiger, Philadelphia and New York, 1915. Price, cloth, $6.00 net.

THE INVERTEBRAL FORAMINA IN MAN. The morphology of the intervertebral foramina in man, including a description of their contents and adjacent parts with a special reference to the nervous structures. By HAROLD SWANBERG. Chicago Scientific Publishing Company, Chicago, 1915. Price, $1.75.

MANUAL OF GYNÆCOLOGY, FOR STUDENTS AND PRACTITIONERS. By SAMUEL J. CAMERON, assistant to the regius professor of midwifery, University of Glasgow; gynæcologist and obstetric surgeon to the Royal Glasgow Maternity and Women's Hospital. Edwin Arnold, London, 1915. Price, 18s net.

MATERIA MEDICA AND PHARMACY; FOR MEDICAL STUDENTS; WITH AN APPENDIX ON INCOMPATIBILITY. Third edition. By REGINALD R. BENNETT, B.Sc. (Lond.), F.I.C. H. K. Lewis, London, 1915. Price, 4s. 6d. net.

OUTLINE OF INTERNAL MEDICINE, FOR THE USE OF NURSES. By CLIFFORD BAILEY FARR, A.M., M.D. Lea and Febiger, Philadelphia and New York, 1915.

PRINCIPLES OF BACTERIOLOGY, A PRACTICAL MANUAL FOR STUDENTS AND PRACTITIONERS OF MEDICINE. By A. C. ABBOTT, M.D., professor of hygiene and bacteriology, University of Pennsylvania. Lea and Febiger, Philadelphia and New York, 1915.

URGENT SYMPTOMS IN MEDICAL PRACTICE. By ROBERT SAUNDBY, M.D., Edin., Lt.-Col. R.A.M.C. Edwin Arnold, M.D., London, 1915. Price, 7s. 6d. net.

Res Judicatæ

WAR WOUNDS—THE PREVALENCE OF INFECTION—TREATMENT

In the present war the wounds that come under treatment in the base hospitals are, in one respect at least, very similar to those met with in the American Civil War and the Franco-Prussian war: they are all infected, and for the most part heavily infected. They are the inevitable consequence of trench warfare, where strict personal hygiene is an impossibility, where the severely wounded may remain unattended for hours or even days, and where the seat of strife is in districts long under cultivation. There is little scope for primary aseptic surgery; and in major injuries antiseptics fail to prevent the development of infections deeply implanted at the time of injury. We are thus hurled back to the pre-Listerian era; to the era of unsutured wounds, early amputations, spreading cellulitis, and gangrene. Many cases of fracture and of injury to the knee-joint have had to be subjected to amputation.

Shrapnel and shell produce lacerated and contused wounds; frequently carry in dirt and fragments of clothing; and are invariably the conveyers of infection, either gas or tetanus bacilli or the common pyogenic organisms.

In the treatment of these lacerated and infected wounds drainage is the key-note. This is secured by

1. The avoidance of sutures and packing;
2. The use of drainage tubes;
3. The promotion of lymph lavage by
    (*a*) The use of dressings soaked in hypertonic solutions, (preferably ½ per cent. citrate of soda and 5 per cent. salt);
    (*b*) Warm fomentations;
    (*c*) Continuous irrigations or immersion.

If seen early, excision of the lacerated and devitalized tissue and cauterization have had some vogue. Swabbing with 2 per cent. alcoholic solution of iodine, or irrigation with tincture of iodine 2 drachms to the pint of water, carbolic acid 1:20 to 1:40, lysol 1 drachm to the pint, and peroxide of hydrogen, have proved useful. Peroxide appears to be especially indicated in sloughing or gangrenous wounds; but once the infection has made headway, the use of antiseptics has, in the opinion of many, proved utterly futile.

For gas bacillus infections no specific treatment has yet been found. Professor Weinberg of the Pasteur Institute has produced a serum of which hope is entertained. Infusion of oxygen into the tissues beyond the zone of infection is also favoured. The best results, however, are obtained by early amputation, leaving the stump wide open, and applying peroxide of hydrogen. Crile states that, while in addition to the above methods heavy cauterzations are advocated by others, the mastery of the disease is for the future.

We are thus face to face with the fact that the problem of wound infection still remains unsolved, and our greatest hope at the present time undoubtedly is in the researches of Colonel Sir A. E. Wright at the Research Laboratory attached to No. 13 General Hospital, Boulogne-sur-Mer. In a series of four extremely engrossing articles, appearing in April and May numbers of the *British Medical Journal*, Wright describes the nature of his investigations on wound infections. Up to the present his bacteriological researches have led him to urge the importance of drainage and the promotion of lymph lavage, by the methods already described, with the use in certain cases of specific vaccines.

The wounds which are not infected are those produced by rifle bullets. The South African type of wound is, however, unfortunately only occasionally seen in the base hospitals of the Western front. They are clean cut and tend to heal rapidly. In these cases the associated injuries to bones, internal organs, blood vessels, and nerves, offer a field for aseptic surgery; and the results are those obtained in all well organized hospitals the world over.

Obituary

Dr. Arthur Pallant, of Victoria, British Columbia, was accidentally killed on June 25th by being crushed beneath his automobile, which overturned. Dr. Pallant, who was in his sixty-first year, was born at Maidenhead, England, where he first went into practice. Later, he removed to Harley Street, London, and seven years ago he retired and went to Vancouver. He leaves a widow, one daughter and two sons, one of whom, Lieutenant H. Pallant, is on active service.

Dr. Harry Williams was shot and instantly killed on July 2nd by a man named Holmes, of Gravenhurst. Holmes, who was suffering from tuberculosis, was a patient of Dr. Williams at the Gravenhurst Sanitarium. His case was incurable, and it is supposed that the crime was committed in a fit of insanity, brought on, possibly, by the refusal of Dr. Williams to give further treatment. After shooting Dr. Williams, Holmes shot himself. Dr. Williams was the son of the late Dr. Williams, of Allenford, and grandson of the late Bishop Williams, general superintendent of the Methodist Church in Canada. He was about thirty-five years of age. After practicing for some time in Allenford, Dr. Williams went to the Old Country, where he did some post-graduate work. On his return to Canada he joined the staff of the Gravenhurst Sanitarium. At the time of his death, he was looking after the practice of Dr. Victor Ross, of Hamilton.

Dr. Thomas Wylie, of Toronto, died June 25th. Born in Toronto in 1841, Thomas Wylie taught for four years before entering upon the study of medicine. In 1866 he graduated from Victoria University. He went into practice at Manilla, then at Dunstroon, and later at Stayner, Ontario, where he practised for seventeen years. From 1891 to the time of his death he practised in Toronto. Dr. Wylie, at one time, was Conservative member of the Provincial Parliament for West Simcoe.

Dr. H. W. Macgowan, of Knowlton, Quebec, died June 10th. Henry Walter Macgowan was born at Kingsley, Quebec, in 1841. He graduated from McGill University in 1865 and went into practice at Bolton Centre, Quebec. After practising there for about ten years Dr. Macgowan removed to Stanstead and ten years later left Stanstead for Knowlton.

Dr. Michael B. Moran died at St. Joseph's Hospital, Omaha, on June 15th, in the thirty-fifth year of his age. Dr. Moran was born in Nebraska. He graduated from Queen's University last spring.

Dr. Guilford Dudley Yokom died at St. Joseph, Missouri, in the seventy-first year of his age. Dr. Yokom was born near Niagara Falls in 1844. He graduated in 1879 and went into practice in the United States.

Dr. Robert J. Love died at Bangor, Maine, on June 10th, in the fifty-eighth year of his age. Dr. Love was born at Moore's Mills, British Columbia. He graduated from the University of New York in 1885 and went into practice first at Milltown, then at Kingman, and later at Danforth, Maine.

Dr. Mark Bice, of Eburne, British Columbia, died July 13th in the seventy-first yera of his age.

Dr. Andrew W. H. Lindsay, of Halifax, died from heart failure July 21st, while in attendance at a meeting of the Nova Scotia Medical Board, of which he had been the registrar for thirty years. Dr. Lindsay was in the sixty-fourth year of his age; he was born at Pictou, Nova Scotia. After attending the Pictou Academy, he entered Dalhousie University and graduated in 1875. He subsequently took a post-graduate course at the University of Edinburgh and, in 1877, received the degrees of M.B., C.M., and L.R.C.P. On his return to Canada, Dr. Lindsay commenced to practise in Halifax. He became associated with the Halifax Medical College, of which he was a strong supporter until its incorporation into the University. In the words of the President of Dalhousie University, Dr. Lindsay was known as an unusually brilliant teacher of anatomy. His knowledge of the subject was profound, and he never tired of imparting it to those who desired to learn. By the death of Dr. Lindsay, Dalhousie loses one of her staunchest and most valuable friends. His time, his money, his thought were never stinted when the interests of the medical school were in question, and it is no exaggeration to say that no one has done more for medical education in Halifax than Dr. Lindsay.

Dr. Samuel Nash, of Bath, Ontario, died July 7th, in the eighty-third year of his age. Dr. Nash was born at Milford, Ontario. He is survived by five sons and six daughters.

Dr. T. G. Wilson, of St. Placide, Quebec, died July 7th. Dr. Wilson was born at St. Jerome; he was sixty-six years of age and had been in practice at St. Placide for forty years.

Dr. Thomas Cecil Weldon, of Thorold, Ontario, died at the Minnawaski Hospital, Gravenhurst.

News

MARITIME PROVINCES

During the period between January, 1914 and May, 1915, 48 patients were admitted to the Hazelwood Sanatorium at Halifax. All were suffering from tuberculosis in an advanced stage. Twenty-eight patients were discharged, 6 of whom died subsequently and 20 deaths occurred at the Sanatorium. Improvement was shown in 12 cases and 9 are now at work.

The Halifax Board of Health has appointed a committee to consider the establishment of a municipal abattoir subject to government inspection.

The corner stone of the new Miramichi hospital at Newcastle, New Brunswick, was laid July 1st. The hospital, when completed, will contain accommodation fot thirty-one patients.

The annual report of the Prince County Hospital, Prince Edward Island, shows that from June 1st, 1914, to May 31st, 1915, 303 patients were admitted. The accommodation is already overtaxed and it has been decided to enlarge the building

ONTARIO

The Women's College Hospital and Dispensary at Toronto was formally opened on Saturday, July 17th. Dr. Geraldine Oakley has been appointed medical superintendent of the hospital, which has twenty-one beds.

A whooping cough clinic has been extablished at the Toronto Hospital for sick children. This is the first clinic of the kind to be opened on this continent.

MANITOBA

During the first four months of the present year, 4,784 patients received treatment in the Winnipeg General Hospital. This is a thousand more than during the same period last year.

Dr. J. M. Lacey, of Winnipeg, has been appointed assistant chief medical officer for the National Transcontinental railway.

SASKATCHEWAN

Dr. John Franklin Duncan, of London, Ontario, has been appointed assistant surgeon to the mounted police stationed at Regina.

The following have been granted licence to practise in the province: Drs. C. O. Banting, S. E. Burnham, W. J. C. Brawley, W. N. Cole, J. J. Finn, J. W. H. Huykman, A.Keay, J. A. Mathieu, C. E. Scribner, M. Shipley, H. Van De Erve, V. Van De Erve, W. A. Weaver, C. K. Whitelock, H. C. Whitemarsh, I. C. J. Wigg, R. M. Neilson and R. O. T. Rice. Supplemental examinations will be taken by Drs. J. Bruce, L. D. Chapman, J. J. Hetherington, J. L. O. Saucier, A. J. Lafleur, and J. N. Carnduff.

A nursing home, with accommodation for thirty-five nurses, and a temporary isolation hospital are to be added to the Grey Nuns Hospital at Regina.

One hundred and thirty-five cases of chicken-pox were reported in Saskatoon during the month of June. Other cases of infectious disease were: measles, 37 cases; mumps, 4 cases; pulmonary tuberculosis, 1 case; erysipelas, 1 case; syphilis, 2 cases.

ALBERTA

The following physicians have been elected members of the Council of the College of Physicians and Surgeons of the province: Dr. John Park, of Edmonton; Dr. F. W. Crang, of Edmonton South; Dr. D. G. Duggan, of Killam; Dr. R. G. Brett, of Banff; Dr. R. D. Sanson, of Calgary; Dr. G. E. Learmouth, of High River, and Dr. W. S. Galbraith, of Medicine Hat.

The following resolution was passed unanimously at a meeting of the Edmonton Academy of Medicine on July 15th:

"That the Academy of Medicine of the City of Edmonton go on record as being in favor of prohibition in the Province of Alberta and endorse the proposed liquor act for the suppression of the liquor traffic in Alberta."

BRITISH COLUMBIA

THE first annual meeting of the board of the Canadian Pacific Railway Employee's Medical Association took place at Vancouver on June 24th, 25th and 26th. The attendance was good and representatives from all parts of the province were present. The election of officers resulted as follows: president, Mr. F. W. Peters (re-elected); vice-president, Mr. G. R. Thompson, (re-elected), of Smelter; secretary-treasurer, Mr. A. M. James, of Vancouver; executive committee, Messrs. F. W. Peters and D. A. Munro, of Vancouver; R. H. Urquhart of Revelstoke; F. R. McCharles, of Nelson, and D. Proctor, of Vancouver.

DR. L. T. DAVIS, of Vancouver, has been appointed ship's doctor on the Blue Funnel Line Steamship *Talthybius*.

MEDICAL COLLEGES

Queen's University

AMONG many other gifts, a motor ambulance has been given to Queen's Military Hospital by Messrs. A. Davis & Sons, Limited, of Kingston.

ARMY MEDICAL SERVICES

DR. G. G. NASMITH is now in charge of the bacteriological work of the Indian corps in addition to looking after the water supply and sanitation of the first Army Corps at the front.

DR. CLARKE, of Calgary, with a party of forty members of the Army Medical Corps, recently left Calgary en route for the front.

DR. ELLA SCARLETT SYNGE, of Vancouver, has left for Serbia in command of the Vancouver Women's Volunteer Reserve. The unit will probably be established at Nisch.

DRS. F. S. KEELE and H. A. Gordon, of Portage la Prairie, have left for France to join the staff of No. 3 Stationary Hospital.

Dr. J. H. Hamilton, of Revelstoke, British Columbia, has been gazetted medical officer to the fifty-fourth battalion, which is now in camp at Vernon, British Columbia.

Lieutenant Lloyd Warner, A.M.C., who for the past year has been serving as house surgeon at the Winnipeg General Hospital, has left for service overseas.

The following doctors have joined the Royal Army Medical Corps: Dr. H. J. Williamson, captain, and Dr. Hodder, of Port Arthur, Ontario; Dr. J. Bryce McMurrich, Dr. S. J. N. Magwood, of Toronto; Dr. R. R. Wallace, of Hamilton; Dr. W. W. Pirt, of Carman, Manitoba; Dr. R. D. Nasmyth, of Moose Jaw; Dr. Kalichmann, of Winnipeg; Drs. W. D. Ferris, W. A. Proud, E. Sheffield, and F. A. Keillor, of Edmonton; Dr. Ross Millar, of Amherst, Nova Scotia; Dr. R. J. Kee, of Niagara-on-the-Lake; Dr. R. W. Young, of Waterloo, Ontario; Dr. C. A. Ings, of Calgary; Dr. Henderson, of Sarnia; Dr. W. S. MacDonnell, of Syndey, Nova Scotia; Dr. V. F. Stock, of Stratford, Ontario; Dr. Thos. H. Lunney, of St. John, New Brunswick; Dr. James Sutherland, of Blaine, Saskatchewan; Drs. W. A. Costain, S. H. McCoy, of Toronto; Dr. G. H. L. Armstrong, of Echo Bay; and Dr. Gavillier, of Owen Sound, Ontario.

The following medical men attached to the Canadian Army Medical Corps have been gazetted to temporary lieutenancies in the Royal Army Medical Corps: Lieutenants A. M. Fisher, S. S. King, C. D. Hamilton, W. J. Grant, C. A. Greaves, W. C. Gowdey, H. Lasnier, C. W. Morris, A. J. Lomas, T. J. Costello, W. W. Patton, J. J. Thompson, W. F. MacDonald, F. J. Brodie, W. P. Mackey, G. W. Whitman, H. S. Moore, B. E. Lang, A. R. Thomson, J. C. Chisholm, G. F. Hill, H. M. Godfrey, N. MacDonald, R. E. Johnston, Capt. Johnson, H. G. Goulthard, L. A. C. Panton, N. E. MacDougall, M. J. Vigneux, J. D. Adamson, W. W. Kennedy, R. Ingram, O. E. Finch, W. H. Lambert.

The following non-commissioned officers and men are promoted to be temporary lieutenants: Sergeant-Major Kidd, Sergeant MacLachlan, Sergeant McQuay, Corporal Coulter, Private M. C. Burke, Private A. D. Forbes; to be temporary second lieutenants: S. A. Forbes, H. A. Ash; to be temporary quartermaster with honorary rank of lieutenant: C. Grayson.

Dr. Montague, of Winnipeg, has been gazetted Major with the honorary rank of colonel in the Army Medical Corps, and will leave shortly for England. Dr. Montague was Minister of Public Works in the Roblin government.

Dr. W. B. Cosby who has been serving as house surgeon at the Toronto General Hospital, has been appointed medical officer of the 58th Battalion.

A course of instruction is to be held early this month at the mobilization camp, Sarcee Reserve, Calgary. Medical practitioners who are registered in the Province of Alberta and who have joined the Army Medical Corps are eligible to attend the course. They will receive $2.00 a day and a field allowance of sixty cents a day and, on completion of the course, will be attached to the field ambulance depôt at Calgary.

Dr. J. F. Hummell, of Stratford, Ontario, who was wounded on May 14th, has been recommended for the Victoria Cross. Dr. Hummell is now with the Canadian Field Ambulance.

Dr. Gordon D. Alkinson, of Derby Junction, New Brunswick, has left for Serbia.

It is reported that Mr. H. S. Beland, M.P., is a prisoner of war.

No. 5 General Hospital, C E.F., is now in training on Macaulay Plains, British Columbia. The unit was offered by the province of British Columbia in April, the offer being made through Major Hart of Victoria; the unit was accepted early in June and mobilize ation was at once commenced. The credit of making the first proposal in connexion with the matter goes to the Vancouver General Hospital. Substantial gifts, among them two motor ambulances, have already been made to the hospital and it is the intention of the Red Cross Society to organize a tag day throughout the province in order to raise the extra funds needed for equipment. The numerical strength of the corps is about 176 and includes 73 nursing sisters. The following is the list of officers.

Commanding Officer: Major E. C. Hart, P.A.D.M.S., Victoria.

Staff: Major F. C. McTavish, Vancouver; Captain S. Bonnell, Fernie; Captain R. B. Boucher, Vancouver; Captain H. L. Burris, Kamloops; Captain J. A. E. Campbell, Vancouver; Captain W. A. Clarke, Vancouver; Captain D. A. Dunbar, Burnaby; Captain A.

C. Frost, Ladysmith; Captain A. J. Gibson, Victoria; Captain T. B. Green, New Westminster; Captain D. P. Hanington, Wilmer; Captain J. H. Hogle, Vancouver; Captain H. C. L. Lindsay, Vancouver; Captain H. H. McIntosh, Vancouver; Captain W. B. McKechnie, Vancouver; Captain C. S. McKee, Vancouver; Captain G. H. Manchester, New Westminster; Captain D. J. Millard, N. Battleford; Captain R. L. Miller, Victoria; Captain A. S. Monro, Vancouver; Captain F. J. Nicholson, Vancouver; Captain L. J. O'Brien, Nanaimo; Captain F. P. Patterson, Vancouver; Captain A. P. Procter, Vancouver; Captain H. Robertson, Victoria; Captain A. B. Schinbein, Vancouver; Captain W. H. Sutherland, Revelstoke; Captain W. P. Walker, Victoria; Captain J. T. Wall, Prince Rupert; Captain H. A. Whillans, Victoria; Captain W. A. Wilson, Victoria; Quartermasters: Captain R. F. Winch, Vancouver; Captain J. Lewin, Victoria; Dental Surgeon: Captain L. Hartman, Victoria; Warrant officers: Sergt.-Major R. Glass, R.A.M.C., Vancouver; Sergt.-Major A. Morrison, Vancouver.

THE provincial government will contribute $10,000 towards the cost of equipment of the stationary field hospital which is to be sent overseas from the province of Saskatchewan. An equal sum will be contributed by the College of Physicians and Surgeons and it is hoped that a further $20,000 will be subscribed by various organizations in the province.

THE following is an extract from a letter from Dr. Hanford McKee, of Montreal, who is in charge of a hospital in France.

Since coming to France on February 2nd, there has been little time for anything but work. I have charge of a field hospital of over three hundred beds. We have the beds in large Indian pattern tents, which hold eight beds with bed-side tables and a large central table, and still have lots of room for moving about with a stretcher. I have seven of these tents in a row, making wards of fifty-six beds. We have a large tent for a dressing tent, a large one for a dispensary, two for operating rooms, one for *x*-ray, and one for laboratory. Williams of Sherbrooke, Munroe of Saskatoon, Morris of Windsor, Nova Scotia, and Bauld of Montreal, look after the surgical work, while Gwyn of Philadelphia does medicine and runs the laboratory. A very efficient staff and they have done some splendid work here. We also have thirty-five nurses, among whom are Miss Galt and Miss Upton, Montreal General Hospital nurses. The work comes in batches, of course, and when the rush is on we have just all we can do. The surgery varies to all degrees, and we have found the cases do remarkably well with the open-air treatment that we are able to give them. Gwyn has done some excellent work. We have had quite a few cases of what they call spring nephritis. It comes on very quickly, the patient getting to the convulsion stage in a day or two. The condition subsides as quickly as it starts. The gas cases have been very interesting clinically, but like so many things of clinical interest, very disastrous for the patient. Gwyn says they get an acute œdema of the lungs, a non-septic pneumonia, with a bronchitis. The kidneys are also affected and, in some cases, the feet have had the appearance one gets in Raynaud's disease. Gwyn has done well with his cases, with atropine and morphine. Sir John Bradford looks upon the condition as an acidosis and has been working along that line. Our cases have all recovered. A lot of the gas cases came in with marked photophobia and spasm of the lids. This was followed in a few days by quite a severe iritis but whether that was a coincidence or not I am not prepared to say as yet. I have had a lot of eye and ear work, mostly radical surgical methods, as most of the eye injuries are very severe. Most of my time, though, is taken up with administration of the different branches of the hospital, and I don't care to have any more to do or any more responsibility than I have had. The amount of office work in a military hospital of even this size is considerable. We can hear the boom of the big guns here, and can tell pretty well when to get ready for casualties. Some of the men tell very interesting tales, but all are agreed that we need more big guns, and more still. One big Scotchman broke up a discussion on the war the other day, in one of the wards, by saying he thought the first ten years would be the hardest! Another one said, "Man, but it was grand to toss them!" meaning bayonetting them and throwing them over your head. I have never seen anything more sickening in my life than the ambulance train loads that one sees sent in here. Personally I feel very pessimistic over the war, and fear it will last a long while yet. However, we'll hope on and hope ever.

CORRESPONDENCE FROM THE SEAT OF WAR

La Panne, Belgium, May 20th, 1915

SIR WILLIAM OSLER was kind enough to send my last two letters out to The Canadian Medical Association Journal. However, on this occasion I have determined to send one direct.

About the middle of February Dr. Depage prepared for heavy casualties in the spring and began to enlarge the hospital at La Panne so that 1,000 patients might be accommodated. At present all the new galvanized iron buildings are almost completed, and indeed, for a short time Pavilion I, or "British Pavillon", with its one hundred beds was filled. Part of the "Everyman Pavillon" has been opened and the "Pavillon Albert-Elisabeth" is shortly to receive patients. No expense seems to have been spared and for temporary buildings they seem well nigh luxurious. I cannot believe that the British hospitals are as well fitted up. All these pavilions have one or more operating rooms. The reception pavilion, where all the wounded will be brought on their arrival and where *x*-ray pictures will be taken and immediate operations performed is nearly ready. It will contain forty beds. A new laundry and garage have been erected, a villa has been made to accommodate the pathological laboratory, the kitchens and dining room have been enlarged and you will understand that the Belgian soldiers and civilian workmen have been kept very busy. More villas have been commandeered as the staff of doctors and nurses has greatly increased. It is almost incredible to us and it is no wonder that our visitors are surprised when we take them into the little villa where scalpels, scissors and all kinds of forceps are made from the rough, unshapened metal into the finished product, with nickel plating and all. Dr. Depage is determined to have everything at hand and only the other day a long needle for hypodermic injections of oxygen was made for him in a few hours. Soldiers were found who had been cutlers and metal workers "*en civil*" and perhaps they are not sorry to leave the trenches!

A shortage of Red Cross and St. John's nurses at Boulogne began to show itself and some of those lent to Dr. Depage were recalled: now, however, thirty-four of the American Red Cross have arrived and the twenty Canadian nurses are in London on their way here. Five American Red Cross surgeons have recently come and more Belgian surgeons have joined our forces so, at present, there are almost thirty on the staff.

One has to admit that it is better to be prepared, but it seems questionable whether the thousand beds will ever be filled with acute cases (for surely the convalescent should not be kept so close to the firing line) especially since the Belgian army a short time ago has opened a hospital of about 500 beds near here on the road between Furnes and Dunkerque. Up till now we have never had more than 300 patients in the hospital. The work is spasmodic, but it is not difficult to imagine that if fifty-eight cases were admitted in a few hours time we must have been very busy for a day or so operating or doing heavy dressings. The severe fighting has all been in the neighbourhood of Ypres and so to the south of us, but when Ypres and Poperinghe were so much shelled we felt the effects and whole hospitals of civilian and military wounded were evacuated and the patients sent up to us. It is sad to see the wounded civilians still coming in and the blame must not be placed altogether at the door of the Germans. The ignorant peasants who know no place but their little home should be compelled by the Belgian government to leave the dangerous part of the country. In one room on our floor we had five wounded children at one time, one little baby of three weeks lost its mother by the same shell or bomb that tore away part of its foot. Perhaps by this time pictures of these children in the illustrated papers have reached Canada. Civilians are still to be found in towns like Furnes and Coxyde, which have been shelled by the Germans off and on for months and peasants are living at this moment in cottages between the lines of hostile trenches. A German prisoner has told me how kind these people were in selling eggs and milk to them: I am afraid that to many of them the offer of money for their "itching palms" has been too tempting and they have become paid spies.

With the exception of a few bombs dropped by the Germans on February 26th and which did little damage, La Panne has been left untouched though on nearly every fine day the German machines fly over us and are shelled at with great vigour by the Belgian guns hidden on the shore and in the sand dunes about here. "Why don't the Germans shell us?" is a question everyone asks when he realises that the big German guns, which have so recently bombarded Dunkerque at a distance of twenty-three or twenty-four miles are only twelve miles away from us and, of course, the smaller guns just above Nieuport are much closer. Some answer that we are not shelled because the Queen, once a Bavarian princess, lives here, but she has been in England on several occasions for two weeks at a time and that fact must have been known to the enemy. La Panne is not a very important place in the military sense, but there are always troops to the number of 12,000 to 20,000 resting here and staff officers are quartered in the hotels. On slack days, when people have time to think or to invent, we always hear the same rumour—it is an old piece of gossip by now—that a message has been dropped from an æroplane to the effect that we are to be bombarded. "Next Sunday" seems to be the favourite day, but it is like the children's saying: "Always jam to-morrow, but never jam to-day," and nothing has happened yet. We often realize that we are close to the firing line and it is a fine sight to see the British monitors (almost the oldest boats now in use) firing with their 9-inch gun at the German batteries beyond Nieuport. These boats are sometimes stationed a few hundred yards out from shore, and just opposite the hospital. Of course a British æroplane, above the object aimed at, telegraphs back by wireless the result of the shot and thus directs the firing. Twice the H.M.S. V—— has fired her 12-inch guns. Though she was more than three miles out to sea, the noise was terrific and shook all the buildings here. A hydro-aeroplane has been about several times. It is a very pretty sight to see it come down on the water and after running along a little way, on its floats, rise again on the wing. The Belgian recruits in the meanwhile are shooting at targets set up on the shore and it is almost humorous when one knows that real live Germans are not a great way off! On two occasions floating mines have been cast up on shore—the first was emptied successfully, but a soldier became impatient with the tightly-screwed nut of the second and the deadly thing exploded and killed four soldiers outright and wounded several others. Mines should be shot at with guns and exploded in this way.

On April 5th we witnessed an interesting ceremony, a review and march past of the troops. Prince Leopold, aged about fourteen, appeared for the first time as a private and was presented to his regiment, the "*12ièm de ligne*". We saw him from a short distance trudging along manfully in the heavy sand close to the standard bearer. The King and Queen of the Belgians were there, but the most interesting figure was that of a boy-scout (13½ years) who was marching with the men. He was carrying his carbine for the first time—the others, of course, have rifles. This regiment covered itself with glory at Liège but was in danger of being surrounded and the boy scout offered his services and led all the soldiers through narrow streets and lanes to the other side of the town and effected their escape. As a reward the little fellow was allowed to join the colours. At this and other reviews we saw the queen, but we have been all rather amused, in reading accounts of La Panne, to be told that "shells were bursting about Her Majesty." I cannot testify to the truth of all stories of La Panne. An article in the St. Louis *Post-Despatch* appealed much to the sense of humour of us all and made delightful reading.

Since the days have become longer and the weather warmer it has been a great pleasure to walk up the shore or out over the dunes. The fishing boats go out at high tide, the shore presents a much busier appearance and the Belgian soldiers go in bathing, evidently a company at a time. One may scare up an occasional pheasant on the dunes and the skylarks mount high in the air singing merrily, oblivious to the "avions" or "bird machines" above them. We have several times visited a one-armed windmill which we can see from the hospital. It is a very massive affair, and carved in one of the big pieces of timber is "Ian Façon, ano 1683." The fear that communications may be carried on with the enemy is great and the miller is compelled by the authorities to keep the arm perpendicular, when not in motion. It might so readily be employed as a semaphore as it stands out so prominently on the skyline. There is no doubt that there are spies about, for the telephone wire between here and a look-out point only ten minutes' walk up the coast, was cut and mended three times two Sundays ago: again, a Belgian officer told me he was sure there was a spy in his company. He noticed that when they reached a certain point at the same time every evening, on their way to relieve another body of men in the trenches, the Germans always shelled them. To change the time of departure every evening was of no avail, for a sky-rocket was sent up immediately behind the company as they were on the point of starting! The other day, too, we walked up to Oestdunkerque and to the French battery on the coast close to Nieuport. The colonel of the Zouaves, with whom we had tea, said he was convinced that there was a telephone wire direct to the German headquarters of that district, for he and his staff were inevitably shelled when they moved about. Though after repeated searchings, up till that time the wire could not be found.

The "Grand Place" at Furnes has lost some of its buildings, but the Hôtel de Ville and the "House of the Spanish Officers" had not been touched when we were last there. The Belgian Field

Hospital (British surgeons) has had to move to Hoogstade for the school in which it was situated has been struck several times by shells. It is still a dressing station and the operating room is in the cellar. Indeed the other day the chief of police and the brewer of the town were dressed there before being brought to us at La Panne.

Just off the road to Furnes there is a very interesting spot. In the eleventh century this was the site of the "Abbaye de St. Idesbold." For centuries after, the fine old building with its round tower was a farmhouse and now large canvas ærodromes in the fields surround it and French, Belgian and British machines are housed there. A Belgian officer who had been a patient in the hospital showed us about this aviation park. It seems that the Renault is as satisfactory as any engine they have. On the "Scouting Machines" a wireless transmitter is carried, but no receiver. In sending messages a coil of about fifty feet of wire is dropped. At closer range we saw the machine gun. The "observateur" works this from his seat or uses a rifle and also releases the bombs which are slung like pails beneath the "body." Some of the British airmen who did such good work above Ostende told us at La Panne that one cannot be at all sure of hitting the object aimed at unless he descends to about two hundred feet above it. "Then," as he expressed it, "the enemy turn the hose on us"—for the bullets come from the anti-aircraft guns exactly like a stream of water.

There is a British Mission at La Panne, quartered in a villa close to the "Palace". A British colonel is in charge and with him are associated other army officers of high station and a naval captain. They do much to coördinate the work of the Belgian and British armies and to direct the work of the "monitors" and other British ships so that they may fire in conjunction with the British naval guns on land. They also keep an eye on the Britishers in La Panne to see that we are bona fide Red Cross workers and not spies! The "Mission" receives despatches from British headquarters every day and we are constantly endeavouring to learn the latest news from them but, alas, they are never very communicative.

Maxine Elliott has lived all the winter on a barge between Furnes and Adinkerque. She distributes clothing and food to the Belgian civilians. Some of us had the pleasure of having tea with her one afternoon and the barge, rude enough on the outside, was fitted up in a very comfortable fashion. Many women are doing splendid work in Flanders and the authoress, Sarah Macnaughton, has a soup kitchen for the civilians, also close to Adinkerque.

Apart from occasional cases of scarlet fever which have broken out in the hospital we have seen little truly medical.

To turn to the wounded. As before, most of the wounds have been caused by fragments of shell or shrapnel bullets but it is interesting to note that one night after a German charge, in which the enemy took a Belgian trench, practically all of the twenty-eight who were admitted were wounded by rifle bullets and about a third of these had been hit in the left hand or arm. These parts of course are most exposed in firing from a trench. Of bayonet wounds I have seen only two and one of these was accidentally inflicted in La Panne. We have seen several cases of "accidental" shooting of the hand amongst soldiers who have just received orders to resume life "*dans les tranchées*". We have had several cases wounded by hand grenades and these may be very troublesome. Not all our cases were due to wounds. I saw, for the first time, a posterior dislocation of the clavicle in a soldier who had been injured in an automobile smash-up. We also had two football accidents, a broken leg and an ugly cut running along the infraorbital margin to the inner canthus of the eye.

Contrary to what was expected, we have had very few cases of aneurysms, and no arterio-venous ones with a rough machinery murmur, as I had seen at Oxford. Perhaps it is because shell and shrapnel bullet wounds so largely predominate. I can only recall two cases of aneurysm, the first, where a rifle bullet passed through the thigh just above the knee; the bone was untouched and the exit and entrance wounds healed nicely, but about a week later, there was a large swelling, with expansile pulsation, situated posteriorly. A loud bruit could be heard. Dr. Depage had to tie the artery. The other case was in a man who had a compound fracture and ugly wound of the right leg caused by a piece of shell. The left limb was "peppered" with tiny fragments of metal—these latter were left and the skin soon healed over. About three weeks later a swelling of the size of a walnut appeared at the lower part of the popliteal space and this showed pulsation. It was like a pulsating hæmatoma, and I had considerable difficulty in getting at and ligating some small branches of the popliteal artery and no definite sac was found. The foreign body was not discovered and could not have been larger than the head of a pin.

We have had several, which might almost be justly called, "freak cases". The brass "head" (containing the fuse) of a shell, about three and a half inches in diameter and of bluntly conical shape, entered the upper part of the posterior aspect of a man's thigh and passed down just beneath the deep fascia and was extracted at a point a short distance above the knee. Little damage was done to the muscles. This "projectile" weighed about five pounds. Another case was that of our second bayonet wound. A German was brought to us after having lain for some hours on the field. A long, thin French bayonet had been thrust through his abdomen from behind and here there was a fair-sized wound, but on the anterior surface there was only a very tiny mark close to the umbilicus where the point had just emerged. He had no abdominal symptoms or signs and after several days rest in bed was sent on to a detention camp. It is hardly conceivable that the intestine was not pierced in at least several places, but evidently during his forced rest in the open a plastic exudate effectually sealed over the perforations. In the *x*-ray plate of a foot we counted twenty-three pieces of shell and many of these were extracted, but ultimately the poor fellow lost his foot. Suppuration is nearly always so great in these wounds to dirty feet. In another case the left thigh and leg were riddled with shrapnel bullets and the left arm had received three perforating wounds. On removing his trousers four bullets dropped on the tiled floor of the operating room. I removed three more which lay just under the skin of the thigh and leg and later, after an *x*-ray picture was taken, again three were removed.

As I once wrote before, tetanus has not been very prevalent with us fortunately and since we have had a good supply of the antiserum the pathologist has given every case five hundred units on admission. On the other hand, though there was a lull for a time, we have had many cases of "gas gangrene"—but it should rather be termed gaseous infection (*bacillus ærogenes capsulatus*) for gangrene is not always present. One cannot tell in which cases this infection will develop and we have learnt that we cannot be too careful. A routine treatment for all cases was as far as possible carried out on admission. The dry gauze and temporary iodine dressing is removed, the region of the wound is washed with soap and water and the part shaved. Then, after a further cleansing with ether or benzine, iodine is painted on. If it seems necessary and the time of day permits, an *x*-ray is taken immediately (the wound being covered lightly with gauze.) A ring of skin is now cut away from about the wound of entrance (and of exit, if present) and if it does not involve the section of important structures the two wounds are opened into one by cutting the tissues between.

Any fragments of metal or dirty clothing are removed or loose pieces of bone are taken out. The track is mopped out or irrigated with hydrogen peroxide and the wound kept open by packing with cyanide gauze or by the insertion of a fenestrated drainage tube. Wherever the *corps étranger* is accessible, whether shell fragment, shrapnel or rifle bullet, it is removed at once. I might remark here that one cannot always depend on the x-ray if the presence of a foreign body is suspected—wood must not be forgotten, for on several occasions we have found small pieces at the bottom of a suppurating wound (notably one case of a foot) from which metal had previously been removed. The *abri* covering the trench is made of wood and on the bursting of a shell, splinters of it may be driven into the flesh. If the dreaded gaseous infection has made itself known, by reason of subcutaneous emphysema, brownish discolouration of the skin, bubbles of gas in the brownish red discharge or by the characteristic odour of this, the wound must be more widely opened and we have also employed circular incisions of the skin and subcutaneous tissues above the areas of discolouration to stop the spread of the infection. The wounds are now irrigated with hydrogen peroxide twice a day and at the same time oxygen is injected with a hollow needle above and below, heed being taken that this procedure drives the infection towards the original wound. Between dressings, gauze, moistened with hydrogen peroxide, is applied. Discolouration of the skin does not make a diagnosis as the reaction of some skins to iodine or to mercuric cyanide may stimulate the true *tache*. And again, as in the case below, this discolouration may be absent or practically so until the late stages of the infection. Often the temperature is not above 100°, but the pulse is always much quickened. We have not tried Wright's treatment of such wounds with hypertonic saline and sodium citrate. For the most part we have been successful in saving the life of the patient and in saving the limb, though, at times, at the expense of, what one might call, cruel deforming operations. From the point of view of prognosis, the cases fall into two broad classes, a less severe where the infection is only in the directly subcutaneous tissues and a second one where the outlook is much more grave, in which the muscles are involved. In the latter instance it is obvious that cross section of the muscles gives more chance of opening up widely, for these tissues contract away from the wound, though they may swell. But after trying to open up by an incision parallel to the muscle-fibres the tissues swell and tend to shut out the air. Professor Wineberg of the Pasteur Institute, Paris, visited us to introduce his anti-serum—made by inoculating horses with increasing doses of the organism. He hopes soon to supply all the allied armies with a sufficient quantity for a prophylactic dose after every wound. So far we cannot say anything definite as to the success of such treatment with serum. Unhappily in the case now to be cited, no treatment could have had any avail.

L. C., a Belgian soldier, was admitted to the "*ambulance de Dr. Depage*" at ten o'clock on the morning of April 20th. He had been wounded in action near Dixmude twenty-three hours before by a rifle bullet which had entered the outer and upper part of the left thigh and had passed through both thighs grazing the scrotum *en route*. Neither femur was touched. The ordinary field dressing had been applied at once and had been changed at 9 p.m. on the 19th. Antitetanic serum had been given. On admission the patient appeared gravely ill and very toxic. His temperature was 101·4° and pulse 112 and weak. The respirations were increased. He was vomiting thin brownish liquid. The left thigh was not swollen and showed nothing beyond the wounds of entrance and exit. The right, however, showed a few brownish patches just below the inguinal ligament and was enormously swollen and "crackled" beneath the fingers, below as well as above the level of the track of the bullet. This subcutaneous emphysema extended up as far as the right axilla and over the front of the abdomen but there was no discolouration in these regions. On pressing the right thigh very foul smelling brownish discharge came out from both wounds together with bubbles of gas. The thigh was tympanitic on percussion. Amputation would have been useless. A few incisions were made just above the patchy skin and gas escaped under considerable pressure. The subcutaneous fat was of a greyish green hue. Anti-serum was given intravenously and injected into these incisions—altogether sixteen cubic centimetres. The thigh was dressed with gauze soaked in the serum. The patient was put to bed and morphia administered. We saw him later at 3 p.m. when he was still vomiting. There was very extensive discolouration by this time over the abdomen, chest and even down the arms as far as the wrists. The pigmentation had also extended down the right leg. The odour in the room we shall never forget. The patient was kept under morphia and died at 7 p.m., just thirty-two hours after a rifle bullet wound in the thigh. It was extremely interesting to us that the left thigh, in which the bullet had first entered, showed no infection. Obviously the organism must have been on the clothes or the skin of the inside of the thighs or scrotum.

I believe the bacillus is often found in the fæces. At post mortem less than two hours after death the organism was recovered from blood taken from all parts of the body. In the right thigh was found a large "*phlegmon gazeux*". There was no peritonitis but marked œdema and active congestion of the mucous membrane of the bowel. Had he come to us sooner, something might have been done. But this was, perhaps, one of the saddest cases we have seen in La Panne and showed in the most striking way that an apparently simple wound may have disastrous consequences. Happily most of our patients are wounded only a very short time or few hours before admission.

In the cases of compound fractures I have not hesitated to use irrigations of one in forty carbolic twice a day and these wounds seem to clean up wonderfully quickly. We should like to have employed more hot fomentations but up till the present the nurses and especially those on at night have had to work so hard.

At St. Idesbald, a tiny watering place about ten minutes walk up the coast, there is a hospital for infectious diseases which break out among the civilians. A fair-sized villa and several temporary wooden lazarettes containing twenty-four beds apiece have been put up and the number will be added to as occasion demands. Professor Nolf of Brussels is in charge and here I have seen some interesting cases. Epidemic cerebro-spinal meningitis seems to be on the increase and the last case, a child of ten months, came from a farm on which 140 soldiers were billeted. Professor Nolf has plenty of the serum. In his opinion there is very likely to be an outbreak of malaria in the inundated areas about Dixmude, for the anopheles are there, and there are always occasional endemic cases in Belgium. It seems that in the time of Louis XIV the country was much flooded and there was a great deal of malaria. Professor Nolf has already had one case, in a woman convalescing from typhoid fever, of chills and rigors which were controlled by doses of quinine. Unfortunately the microscope had not arrived at that time and he was unable to verify his diagnosis. The civilians have been inoculated at the hospital against typhoid by the score, but it is a great pity that Vincent's vaccine cannot be obtained any longer for it was made from cultures of paratyphoid as well as typhoid bacilli, as it has been found that so many of the cases are due to an infection by the former organism. One case of typhoid was of extreme interest as thrombosis of the veins of the lower abdominal wall occurred.

L. C., male, aged thirty-three, entered the hospital on April 25th, after three weeks of illness. His temperature was

104° and the pulse 130 and very easily compressible. He had had marked diarrhœa and incontinence of urine, but there were no "rose spots" on admission. He had been vaccinated elsewhere against typhoid but had received only one dose. The spleen was large and palpable. To Professor Nolf it was obvious that the patient had typhoid fever, though it was not possible, at that time, to have a Widal test of blood culture done. He was put on a strict typhoid diet which seems to have consisted chiefly of sugar and water but was allowed "*lemonade lactique*" ad. lib. On April 29th a small purplish red spot was noted on the umbilicus. This did not fade on pressure and was caused by extravasated blood between the dermis and epidermis. Surrounding this was a greenish halo forming a ring about three inches in diameter. The patient was now delirious. The next day the discolouration appeared in both groins, especially the left, and extended down on to the thighs for a distance of a hand's breadth and also around well into the flanks. Above, it faded out so that the upper border was an almost horizontal line just below the umbilicus. There was no swelling of the legs. Some distension of the abdomen showed itself, due, Professor Nolf thinks, to weakening of the muscular wall and not to portal thrombosis as no intestinal obstruction occurred and there were no signs of ascites. Hot fomentations were applied to the abdominal wall and the patient, now in a very weak and serious condition with marked subsultus tendinum, was given camphor oil in large quantities (eighteen c.c. per diem) together with a milligram of strychnine. Owing to its effect on the bowel the adrenalin, given up to now, was stopped. On May 8th the discolouration began to fade but up till this time the evening temperature registered between 103° and 104° and the pulse ranged between 120 and 140. The temperature curve touched normal for the first time on May 8th. On May 17th, when I last saw him, the signs of thrombosis had practically disappeared, the temperature was normal, the pulse was about 100 and the patient no longer had incontinence of urine or diarrhœa. We consider the patient a lucky fellow and it is to be hoped that the thrombosis will not recur. Evidently the remains of the umbilical vein in the round ligament of the liver and also the superficial external circumflex iliac, the superficial epigastric vein, etc., (which pour their blood into the internal saphenous or femoral vein), were involved. We had a snapshot taken of this striking-looking abdomen, but it gives only a faint idea of the picture.

We have had wounded Belgian soldiers and officers as patients, who have experienced the sensation of a whiff of the poisonous

German gases, but none so far have suffered greatly. A north-east wind is the "ill wind" for the Allies and fortunately of late it has blown in the opposite direction. However, a few hours after the first use of the gas, one of the Belgian generals telephoned to Dr. Depage and the nurses and Belgian women volunteered and sat up till the early hours of the morning making respirators for the Belgian forces.

Few British wounded have come to us as the British sector lies to the south. One of our English chauffeurs was struck in the leg by a small piece of shell whilst driving an ambulance through Furnes and we have had two cases from the British Mission. One of these, Colonel B——, was wounded by several shell fragments whilst on a tour of inspection near Nieuport. He is now convalescing in England. The other was a motor cyclist, who, on the way back from "headquarters," had to turn out into the side of the road to avoid a motor and was thrown violently from his machine. He was travelling at the rate of thirty-five miles an hour but escaped very serious injury. His knee was badly grazed or scraped and some small bits of stone were driven beneath the skin. The capsule of the joint was uninjured though there was considerable effusion. With a posterior splint and a pressure bandage this was soon set to rights. These despatch riders are very brave fellows and theirs is a dangerous life. This man volunteered—he was a small shopkeeper in London—brought his own machine, went through the "Retreat," was wounded once, but remains as cheerful as ever. I trust that these men will receive their due at the close of the war. One afternoon, two sailors, a gunner and an A. B., were brought in from Nieuport. The driver of the ambulance was Dr. Henry Jellett of the Rotunda Hospital, Dublin, he having volunteered as a chauffeur. He delivered the address in Gynæcology at St. John, N.B., last summer and asked me about several of his Montreal friends. The sailors, both Scotsmen, had been wounded about an hour before by a shell which had exploded close to the naval gun. One was wounded in the left lower quadrant of the abdomen. Dr. Depage opened him up immediately, found a perforation, resected a piece of small intestine, which lay close to the iliac colon, cleansed with ether, left in a large drain, and closed with through-and-through sutures. The patient has done very well, and now, three weeks later, the wound, though of course it was infected, has almost entirely healed. Probably the sailor may have to have his abdominal wall re-sutured on account of a hernia. His has been as successful as any of the cases of intestinal wounds. The other man, we sent on to a British hospital ship and thence to England to an eye specialist, as he had a fragment of shell in the orbit which projected through the floor and into the frontal sinus. His skin presented the best example of the tattooist's art that we had ever seen, and the pictures afforded a constant source of amusement to the Belgian surgeons. It was delightful to hear the Belgians trying to pronounce this sailor's name—Auchterloney. They were loth to believe that it was British. We explained that it was Scotch!

To-day has been a very sad one for Dr. Depage and his two sons as well as for all those who had met Madame Depage. With the first intimation of the sinking of the *Lusitania*, came the news that she had been drowned. Madame Depage was returning after collecting money in the United States for this hospital. Dr. Depage had gone to England to meet his wife, but this morning we all attended the funeral and did not welcome her back alive as we had hoped. It was a full and impressive service in the village church. The Queen was present and a large number of Belgian military officers and government officials were there. The nurses in uniform filled one side of the church and they carried the wreaths of flowers in the funeral procession, through the long winding main street of La Panne, along the *Digue* past the hospital and out to the grave amongst the sand dunes. These Germans really have a big account to pay. "Necessity knows no law" must not and cannot be the criterion of action for the peoples of the future.

T. A. MALLOCH.

Medical Societies

MEDICAL COUNCIL OF CANADA

THE annual session of the Medical Council of Canada was held at Ottawa on June 8th, under the presidency of Dr. Thornton. All the provinces were represented as well as the universities, the Governor-in-Council, and the homeopathic body; in fact only two members were absent from their places, and one of these had left Canada on active service. The various reports, including the President's address, the Registrar's report and the Auditor's financial statement were presented the first day, and will be found in full in the "Third Annual Announcement" issued in July.

The question of granting registration to those who had gone overseas for service was fully considered in consequence of several requests from candidates, and it was decided that affirmative action of the Council would be unwise, in that it might possibly compromise the Council in the eyes of the provincial councils, and that the plain duty of the Council was to grant registration strictly within the regulations laid down which regulations were thoroughly understood by all the provincial councils.

In the afternoon of the first day the Special Committee on Standards of Education presented a comprehensive report through their chairman, Dean Connell, of Queen's University, and the report being adopted, the Committee was continued in its important work as a permanent committee. After the appointment of the Nominating Committee the Council adjourned for the day.

On the second day's session being called to order the Finance Committee presented its report recommending certain accounts for payment. The report was adopted. The report of the Education Committee was then presented and discussed in detail. After full discussion it was decided by the Council to order an examination to be held at Montreal and Halifax coincidently on October 12th, 1915, and also to order a spring examination to be held at Toronto and Winnipeg coincidently on June 13th, 1916. Boards of Examiners were duly appointed for October, 1915, and for June, 1916. The Committee on reciprocity with Great Britain presented its report through Dr. A. W. H. Lindsay, and it was adopted.

The Nominating Committee presented its report at the end of the morning session, as follows: Honorary president, Sir Thomas Roddick; president, Dr. R. J. Gibson; vice-president, Dr. John Stewart; registrar, Dr. R. W. Powell.

Executive Committee—Dr. J. C. Connell, Dr. E. P. Lachapelle, Dr. R. G. Brett, Dr. R. S. Thornton, Dr. E. A. P. Hardy, together with the president, the vice-president and the honorary president, ex-officio.

Education Committee—Dr. R. E. Walker, Dr. E. A. Braithwaite, Dr. W. A. Thomson, Dr. J. S. Gray, Dr. W. Spankie, Dr. L. P. Normand, Dr. W. White, the late Dr. A. Lindsay, Dr. S. R. Jenkins, Dr. J. M. McCallum, Dr. P. C. Dagneau, Dr. F. J. Shepherd, Dr. E. P. Lachapelle, Dr. J. C. Connell, Dr. H. A. McCallum, Dr. J. R. Jones, Dr. D. F. Harris, Dr. C. R. Sugden.

Finance Committee—Dr. F. J. Shepherd, Dr. A. M. Young, Dr. R. E. Walker.

Discipline Committee—Dr. A. MacNeill, Dr. J. Park, Dr. E. M. Morgan, Dr. A. Simard.

Rules and Regulations Committee—Dr. W. Bapty, Dr. R. G. Brett, Dr. D. F. Harris, Dr. J. S. Gray, Dr. H. A. McCallum, Dr. A. Simard, Dr. A. B. Atherton, the late Dr. A. Lindsay, Dr. S. R. Jenkins.

Educational Standards Committee—Dr. J. C. Connell, Dr. F. J. Shepherd, Dr. P. C. Dagneau, Dr. J. S. Gray, the late Dr. A. Lindsay.

On motion, the report was adopted. The honorary solicitor, Mr. F. H. Chrysler, K.C., was duly appointed for the year ending June, 1916, and the auditor, Mr. G. L. Blatch, F.C.A., was also appointed for the current council year.

After certain votes of thanks to the four hospitals in Montreal for the use of their public wards, to the Faculty of Medicine of McGill University for the use of the Medical Building for the examinations of 1914, and to the Grand Trunk Railway for the rooms to hold the annual session of Council, the retiring president addressed the Council in vacating the chair, and the newly elected president thanked the Council for the honour conferred upon him in his election to the chair. The Council then adjourned, with a resolution to meet again on the first Tuesday in June, 1916.

ONTARIO MEDICAL COUNCIL

THE question of importance at the recent meeting of the Ontario Medical Council was the establishment of reciprocal relations between the medical councils of the United Kingdom and the Province of Ontario. The following regulation was passed; a certified copy has been forwarded to the Premier of Ontario, who will submit it to the Federal authorities by whom it will be sent to the Home Government:

Every medical practitioner registered in the medical register of the United Kingdom of Great Britain and Ireland, upon proof to the satisfaction of the Registrar of the College of Physicians and Surgeons of Ontario that he is so registered, and that he is of good character, and that he is by law entitled to practise medicine, surgery and midwifery in the United Kingdom, shall, on application to the said Registrar and on payment of such fee not exceeding one hundred dollars as shall be the fee which by Regulation of the Council shall be from time to time charged for registration of all persons entitled to be registered in the province of Ontario, be entitled, without examination in the province of Ontario, to be registered under the provisions of the Ontario Medical Act. Provided that he proves to the satisfaction of the Registrar, that the dipolma or diplomas in respect of which he was registered in the said Medical Register of the United Kingdom was or were granted to him at a time when he was not domiciled in the province of Ontario, or in the course of a period of not less than five years during the whole of which he resided out of the province of Ontario.

It was moved by Dr. Spankie and seconded by Dr. Crain, that whereas it has become known to the members of this council of the College of Physicians of Surgeons and Ontario, that many of our soldiers in Europe are now suffering in special ways from various forms of nervous and mental trouble due to the terrible shock of war, and whereas these various forms of nervous and mental diseases require special treatment and that efforts are being put forth by those in authority to give this special treatment so far as the circumstances and conditions of war permit, nevertheless these circumstances and conditions are such as to render adequate treatment impossible and in consequence many of our brave young men are not receiving the care and chance for life and health which properly specialized and experienced medical treatment and nursing might give them, therefore be it resolved that this Council respectfully but urgently request the government of this province of Ontario to equip at once an expedition of experienced and specially trained physicians and nurses from its public institutions and others specially qualified for such work and despatch them without delay with proper and full equipment to minister to those afflicted and restore them to convalescence and health or where this is impossible or likely to be unduly prolonged, request the War Office to send them home to Canada when suitable accommodation such as that soon available at Whitby be prepared for their reception and that this special treatment and nursing be there continued so long as may be required under the favourable conditions that such location, surroundings and accommodations afford, and that a copy of this Resolution be sent to the Honourable W. H. Hearst, Premier of Ontario.

The Council also appointed a committee to investigate the question of uniformity in matriculation standards and to report at the next meeting of the Council.

It was recommended that the sum of two thousand dollars be granted for the relief of the Belgian physicians and pharmacists.

The officers elected for the year 1915 to 1916 are: President, H. S. Griffin, M.D., of Hamilton; vice-president, Edmund E. King, M.D., of Toronto; registrar-treasurer, H. Wilberforce Aikins, M.D., of Toronto; prosecutor, John Fyfe, of Toronto.

THE MEDICAL SOCIETY OF NOVA SCOTIA

The sixty-second annual meeting of the Medical Society of Nova Scotia was held at Amherst on the 7th and 8th of July, 1915. The medical professions of the town and district proved themselves excellent hosts and the meeting which was favoured with splendid weather was thoroughly enjoyed. His Worship, Mayor Douglas, and Mrs. Douglas were At Home on Wednesday afternoon, July 7th, and on the same evening a banquet was given in the Terrace Hotel. On the afternoon of July 8th, members were taken in motor cars to Tignish, where they were hospitably entertained to a lunch of lobsters.

The following matters of business were transacted:

New Glasgow was selected as the place of meeting for 1916 and Dr. C. J. Miller, of New Glasgow, was elected President. It was arranged that Professor Fraser Harris, of Halifax, be deputed to send an account of the Amherst meeting to the JOURNAL of the Canadian Medical Association. It was also agreed that a committee be appointed to act in conjunction with the Editorial committee of the CANADIAN MEDICAL ASSOCIATION JOURNAL to select papers read at the meeting for publication in extenso in the JOURNAL. A communication from the Pharmaceutical Society in regard to the British Pharmacopœia for 1914 was referred to a committee consisting of Doctors Hattie, Maclean, MacKenzie and Walker. They reported that the new conditions should come into effect in September 1st, 1915.

On the motion of Dr. Hattie, a resolution was passed congratulating those medical men who had volunteered for active service, and, on the suggestion of Dr. Walker, this was made to include the medical students and nurses who had gone from Nova Scotia.

Arising out of a motion by Dr. MacIntosh, of Pugwash, seconded by Dr. Patton, of Truro, the following statement was passed: "Since it has been established that alcohol is not a food, in that none of its elements are incorporated into the tissues, and since the heat its oxidation produces is overcompensated for through the heat lost from the blood-vessels of the skin, and since alcohol is not required to aid any physiological process, and since by its excessive use all systems of the body are injured and the moral nature so altered as to lead to crime, this meeting desires to impress the community with the benefits to be obtained from abstinence from alcohol as a beverage and recommends its use only under advice. This meeting would warn the public that many patent medicines containing large amounts of alcohol are neither foods nor stimulants as advertised."

The following papers were read:

At the morning session on July 7th:

The early diagnosis of pulmonary tuberculosis, by Dr. E. S. Harding, of Montreal;

Artificial pneumo-thorax in the treatment of pulmonary tuberculosis, by Dr. A. F. Miller, Provincial Sanatorium, Kentville;

Eyestrain, by Dr. Elwood T. Easton, of Boston.

At the afternoon meeting:

Military sanitation as applied to farms, by Captain Victor F. Connor, A.M.C.;

Medical sociology, by Dr. S. L. Walker, of Truro.

At the evening meeting:

Non-materialism in medicine, by Professor Fraser Harris, Dalhousie University;

Forty years—plus, by Dr. W. H. Hattie;

Some medical aspects of this war, by Lieutenant-Colonel J. A. Grant, P.A.M.C., A.D.M.S., 6th Division.

Notes on a trip abroad, by Dr. M. Chisholm.

At the morning session on July 8th:

Clinical observations on acute osteomyelitis, by Dr. Macdougall, Halifax.

Sarcoma; differential diagnosis and treatment, by Dr. T. W. Harmer, Boston.

The diagnosis of surgical conditions of the stomach, by Dr. John W. Denis, Boston;

The diagnosis of tuberculosis and other infections of the kidney, by Dr. Benjamin Tenney, Boston;

Five instances of delivery by hysterotomy, by Dr. H. E. Kendall, Halifax.

The paper by Lieutenant-Colonel Grant was an interesting account of the procedures adopted in taking a wounded soldier from the fighting line back to a base hospital and thence to England. In connexion with the subject of recruiting for the Army Medical Corps, a committee consisting of the President and the Secretary of the Provincial Medical Board of Nova Scotia, Dr. W. H. Hattie, Dr. Macdougall and Dr. Corston was appointed to confer with the military authorities.

The papers by Professor Nicholls, Professor Fraser Harris, Dr. Macdougall, Dr. Denis, and Dr. Kendall will appear in full in future issues of the JOURNAL. Abstracts of other papers will be published next month.

NEW BRUNSWICK MEDICAL SOCIETY

THE thirty-fifth annual meeting of the New Brunswick Medical Society was held at Fredericton July 20th and 21st. After the enrolment of members, of whom thirty-five were in attendance, an address of welcome was given by the Mayor of Fredericton. This was followed by the reading of minutes, the reception of delegates and visitors, and the presidential address, delivered by Dr. G. Clowes Van Wart, of Fredericton. The following is a list of the papers and discussions: "Blood pressure," by Dr. F. P. Fleming of St. John; "Toxins" by Dr. J. M. Nugent, of Chipman; Henoch's purpura," by Dr. G. W. Bailey, of Fredericton Junction; "Infant feeding," discussion introduced by Drs. L. M. Curren and S. Skinner, of St. John; "Case for diagnosis," by Dr. W. J. Weaver, of Fredericton; "Diagnosis and treatment of gall stones," discussion introduced by Drs. W. W. White and A. F. Emery, of St. John; "Cancer of the breast," by Dr. W. E. Gray, of Milltown; "Pellagra, with report of case and photographs," by Dr. L. M. Pinault, of Campbellton; "Thyroid insufficiency," by Dr. F. H. Wetmore, of Hampton; "Medical inspection of schools," by Dr. W. H. Irvine, of Fredericton; "Abdominal bands and adhesions," by Dr. H. H. McNally, of Fredericton; and "Reports of cases," by Dr. D. R. Moore, of Stanley.

The election of officers resulted as follows: president, Dr. W. W White, of St. John; first vice-president, Dr. S. C. Murray, of Albert, second vice-president, Dr. B. H. Dougan, of Harvey Station;

recording secretary, Dr. D. C. Malcolm, of St. John; corresponding secretary, Dr. J. D. Lawson, of St. Stephen; treasurer, Dr. W. E. Gray, of Milltown; trustees, Dr. D. R. Moore, of Stanley, Dr. J. B. Gilchrist, of Norton, and Dr. L. M. Curren, of St. John. Dr. G. Clowes Van Wart, of Fredericton, and Dr. J. S. Bentley, of St. John, were appointed delegates to the Canadian Medical Association. The next annual meeting of the Society will take place at St. John.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The thirteenth regular meeting of the Society was held Friday April 9th, 1915, Dr. F. W. Hamilton, president, in the chair.

Living Case: Myositis ossificans traumatica, by Dr. Fraser Gurd.

Case Report: A case of meningitis, with pathological specimen, by Dr. C. A. Peters.

The case was that of a young girl, aged fourteen, admitted to the Montreal General Hospital on March 23rd, and died on the following day. The personal history was without interest; always in good health, had two or three of the diseases of childhood. Family history negative; father, mother, two brothers and three sisters alive and well. The history of the present illness was obtained from the father on the girl's admission. The patient was quite well up to ten days ago, except for a small ulcer on her foot, due to rubbing of boot. On March 13th, she developed a cold in the head, no cough, no expectoration, a rhinitis chiefly. Was up and about and did her usual work until March 20th. On this morning she did not want to get up and remained in bed till the late afternoon when she seemed as usual. On the following day she was feverish, could not get up, refused to speak and drank very little. Next morning she seemed to be the same but in the afternoon had a convulsion lasting half an hour. Did not bite her tongue. The right hand was clenched and supinated, the right leg seemed to be paralysed. The following day was admitted to the hospital. On admission, patient unconscious, with a right-sided hemiplegia, temperature $99\frac{4}{5}°$, respiration 24, pulse 96. Temperature 104° during the night, incontinence of urine and fæces, twitching of right arm; she lies in bed with her right hand open and the left closed; sensation present. Left pupil dilated and inactive and during examination there was a clonic spasm of the right facial muscle lasting about a minute. Moved her left arm frequently but continual twitching of the index finger and thumb of the right hand. Respiration negative, circulatory system negative. A white blood count of 45,000.

Nervous system: Right arm and leg flaccidly paralysed, more especially the arm; right side of face partially paralysed; left eye ptosis, pupil dilated, does not react to light; absolutely no rigidity of neck, no Kernig's sign—the two typical symptoms of meningitis absent. A spinal puncture brought away 4 c.c. of a turbid, whitish fluid which was under pressure; no trace of blood, but 275 cells per c.mm. in the count, chiefly polymorphs.

The following day the patient rapidly grew worse; cyanosis, very comatosed; and died twenty-four hours after admission.

The specimen of the brain explains this unusual set of symptoms. The onset suggested a vascular lesion—the abruptness of the onset and the right-sided paralysis. When the skull-cap was removed the anterior half of the left side of the brain was bulging and from a small incision made into the dura mater several ounces of thick, creamy pus dropped to the floor, and curiously enough the meningitis was limited to the anterior half of the brain on the left side. The right side was practically normal. There was also some exudate at the base of the brain. The ears examined before death were negative and post mortem also negative. But on opening into the vault of the skull over the ethmoid the left nares was filled with a pus similar to that found in the brain, so that undoubtedly the meningitis developed as a result of the rhinitis which she contracted a week previously. A report on the growth, as given by Dr. Rhea gave a diagnosis of acute purulent meningitis. From the ethmoid three organisms were isolated in pure culture, the streptococcus, the *Bacillus coli* and the *Bacillus influenzæ*. Each organism was identified by passing through various media.

Discussion: J. A. Henderson: I am interested in the anatomical question of how this organism succeeded in getting from the ear sinus to the meninges. I am not quite sure, but I think I gathered that pus was found in the sphenoidal cells, but no mention of pus in the temporal or the ethmoidal sinus. I should be very glad to know if any search was made as to the pathway of communication from the ear sinus to the interior of the cranial cavity.

Dr. A. D. Blackader: I should like to know whether in this very interesting case there was a previous history of acute or chronic inflammation in the nostrils or in their associated sinuses. I would be glad also to learn whether the influenzal bacillus was considered as the first invading organism or whether the bacillus coli entered through the blood stream.

Dr. C. A. Peters: With regard to the pus, it was in the ethmoid cells and Dr. Rhea was of the opinion that it extended primarily through just in the same way as from a mastoid to the meninges. Whether in this individual the floor or the roof of the ethmoid cells was thinner than normal it is hard to say, but undoubtedly the infection passed through the cribriform plate. With regard to whether she had anything before in her nose or head, her father stated that this girl was often subject to colds in the head. The bacillus coli was probably a terminal infection as that is not uncommon in such cases. The extraordinary thing was the amount of pus present; there was certainly four to six ounces bulging out the meninges in that localized position and it is hard to say why it remained localized over the left motor area, when there were no adhesions to prevent its spreading.

Papers: 1. Arteriosclerosis, by Dr. A. H. MacCordick.

Discussion: Dr. W. S. Morrow: I should like to congratulate Dr. MacCordick very heartily on his paper, on the hard work he has done and on the modest way in which he has presented his results and conclusions. What interested me especially perhaps was the way in which he brought out the great diversity that is met with in arterial degeneration. If there are any clinicians here who have failed to recognize this in some cases perhaps as much as they should I hope they will take this to heart. I have really been very much perturbed of late at the number of people going about with a diagnosis of "hardening of the arteries." It seems as if when some physicians come to a diagnosis of hardening of the arteries they feel that they have done a very scientific thing. As we all know, to tell a man past middle age that he has hardening of the arteries is about the same thing as to tell him that he is sick. Practically, a large part of the diseases of the latter half of life are mixed up with this hardening of the arteries. In brain diseases we may have high pressure, with hæmorrhage, low pressure with thrombosis, degeneration with general paralysis. Among diseases of the circulatory organs we may mention angina pectoris, hypertrophied and fibrous heart, and various forms of arterial dilatation; in the kidneys we may have interstitial nephritis. Again we may have degeneration of the arteries going on without elevation of blood pressure, especially in syphilitic cases. My point is that we ought to consider that a diagnosis of arteriosclerosis is not the end of the diagnosis, it is the beginning, and I feel very strongly that where the condition is advanced to a point where we have definite disease taking place in the various organs we should in our minds put these local developments very prominently before us, because whether it be a hypertrophied heart or an interstitial nephritis or disease of the cerebral vessels, or aneurysm, the local condition is very often more in need of and more amenable to treatment than the arteriosclerosis which may have caused it. In the early stages where we have only an arteriosclerosis we may direct our treatment to it alone, but usually we must go farther and recognize the local conditions as far more important from a therapeutic point of view.

Dr. A. D. Blackader: I wish to congratulate Dr. MacCordick on the work he has done on this interesting subject and on the very simple methods he has taken to elicit such valuable results.

2. Practical points in the diagnosis of pulmonary tuberculosis, by Dr. E. S. Harding.

DISCUSSION: Dr. A. D. Blackader. This is a subject which interests every one of us, and we are indebted to Dr. Harding for giving us the result of his experience. Diagnosis in pulmonary tuberculosis is not difficult when we are confronted with the startling symptom of hæmoptysis, but as a rule its onset is insidious, and that physician will be most successful in its early detection who makes use of every possible aid in the examination of his patient. A persistent cough in the morning is always suspicious, but nasal and tracheal irritation must be excluded, Pain is a very uncertain and unreliable symptom; more important is the slight afternoon rise in temperature, the slight increase in pulse rate, and the definite loss of weight. The most conclusive signs, excepting always the actual finding of the tubercle bacilli in the sputum are elicited by our examination of the chest. Permit my calling attention to a few points in this examination which in my opinion have not been sufficiently emphasized. In the normal chest the right apex has a lower pitched and more resonant note than the left owing to anatomical differences in the distribution of the bronchial tubes in the two apices, and the breath sounds are slightly more bronchial. Any reversal of this condition—English writers state that even the sameness of the pitch on the two sides is to be regarded with suspicion—should be noted. In our examination we obtain most information by a careful comparison of the two sides, inspiration with inspiration, expiration with expiration. It is never wise to rely on one method of examination—but use all, inspection, palpation, percussion—which is most truthful when done very lightly—and auscultation. Errors are liable to occur in the work of any physician who places his chief dependence on one method of examination only.

Dr. E. S. Harding: In reviewing the literature one finds that each examiner has a separate sign upon which he lays particular stress, but we also find that although he lays particular emphasis upon this one sign his final conclusion is that by itself it is not sufficient to make a positive diagnosis of pulmonary tuberculosis. Most writers lay stress upon a number of signs taken together. Probably the most stress may be laid upon the findings by auscultation. In discussing early signs many lay stress upon their importance in diagnosis, but do not discuss their significance as regards treatment. That is, whether the presence of such and such a sign is sufficient to place a patient under strict sanatorium or tuberculin treatment. This to me is very unsatisfactory and I should far prefer to know the significance of the one sign or signs as regards putting the patient under active treatment.

The fourteenth regular meeting of the Society was held Friday, April 23rd, 1915, Dr. W. F. Hamilton, president, in the Chair.

Pathological Specimens: Series by Dr. L. J. Rhea, exhibited by Dr. Fraser Gurd.

1. *Case of multiple metastatic abscesses, pyæmia.* Patient died of œdema of the glottis and at autopsy an ulcer of the œsophagus was found communicating through its base with the larynx and the cords. The tissues between the œsophagus and trachea were infiltrated and suppurative. Opposite there is a secondary implantation ulcer on the posterior wall of the œsophagus.

2. *Organs from a man brought into hospital with acute retention due to stricture of the urethra.* He died of cerebral embolus from cerebral softening. At autopsy he showed a gangrenous suppurative cystitis and apparently as a secondary feature a mural endocarditis with a thrombus in the appendix of the auricle at the left side. Secondary to that he had a cerebral softening from which he died and multiple infarcts in the kidney. In addition to the mural thrombus in the auricle is an old mitral endocarditis with constriction and signs of a moderate grade of apparently syphilitic aortitis. The whole appendage of the heart is filled up with a firm hard clot. The case was one of simple infection of the gall bladder resulting from stricture of the urethra with generalized infection of the mural endocardium of the heart, with emboli in the brain and in the kid-

neys. This occurring in a man who had previously aortitis and mitral endocarditis.

DEMONSTRATION of a new therapy in carcinoma, with living cases, by Dr. J. R. Goodall.

Two years previously Dr. Goodall, in consultation with Dr. Dalpe on a case of advanced carcinoma of the cervix, did a curettage previous to performing a hysterectomy, leaving nothing but a shell of the cervix. It was found that the inguinal glands were badly involved and nothing more was done. The uterus was packed with a 10 per cent. solution of iodine and this was changed every second day until the patient left the hospital; the prognosis was that she could hardly live six months. The patient, however, lived a year and a half after the operation, dying eventually of metastases. During the interval she had no discharge and no more symptoms so far as the pelvis was concerned. Some time later another inoperable case presented itself and it was then Dr. Goodall associated the packing with iodine with the improvement in the first case. This treatment was carried out and improvement was noted almost at once. Altogether eight cases had been treated with remarkable improvement in each.

DISCUSSION: Dr. J. D. Dixon. I would just like to add a few remarks in connexion with this treatment. Through Dr. Goodall's kindness I was able to treat a case at Lachine with iodine; an Indian woman with very advanced inoperable carcinoma of the cervix. The condition was very extensive and proved by microscopical examination; ulceration was so extensive that the finger easily entered up to the fundus of the uterus, the body was extensively involved and both broad ligaments; hæmorrhage was severe and practically continuous for nine months; she was confined to bed and suffered a good deal. We had tried scraping and acetone with no effect in controlling the hæmorrhage and on February 16th started in with the iodine treatment; at that time she weighed 130 pounds. After a few days treatment, which consisted in curetting the growth and these packings, at first with 25 per cent. solutions and later with 15 per cent., the discharge entirely ceased and the woman began to pick up strength and insisted on getting up. On April 5th she weighed 150 pounds, and has had no hæmorrhage, except a little discharge, occasionally blood stained; general health good. The masses in the broad ligaments are greatly reduced and the previously ulcerating surface is much firmer, does not bleed to the touch and is smooth.

Dr. W. W. Chipman: I am very much interested in this subject, though unfortunately I did not get here in time to hear the first of Dr. Goodall's address. I understand, however, that the treatment he suggests is that of packing the uterus and the cervix with a strong solution of iodine. The results he gives are extremely satisfactory. We who are dealing with cancer of the cervix and of the uterus know what a hopeless condition the subject is in at the present time, even more than it was ten years ago, and anything that will throw light on or increase our knowledge of this condition we will gladly welcome. I understand that the local condition is greatly improved; not only are the symptoms relieved, but the local condition is improved. We all know that these symptoms, the hæmorrhage—the local condition—is largely due to an infection; a secondary organismal infection is grafted upon the new growth. The work of Gray in cancer of the tongue is marvellous in its results; anything that will relieve the infection that is grafted upon the cancerous growth will relieve the symptoms. I would ask whether Dr. Goodall thinks the action is upon the cancerous element itself or the infection that is grafted upon the dead or dying tissue. Certainly the cases that come before us to-night look in a comparatively fair state of health and I should be very glad indeed to try this method and judge it, of course, by its results.

I was in St. Louis in February and was very much interested in the work of Percy, who uses the cautery which Dr. Armstrong will show you to-night. This is used at a dull black heat and practically results in slow cooking of the tissue; his method is to introduce it into the cervix and the uterus and slowly cook the whole space. It takes an hour to an hour and a half, and some eight or ten days after the application of the cautery the whole uterine case, or wall, is supposed to, and frequently does, slough away. He claims for it much better results than the extensive operations of Wertheim, and his contention is that while we do not know the cause of cancer, certainly heat applied in that way seems inimical to the growth of these cells. They are practically discarding the more radical operations of Veit and are coming back to the application of heat. Of course you are familiar with the radium treatment of Kelly and the cautery knife of Vert, the vulgary knife which has been a great disappointment in my hands. If this suggestion of Dr. Goodall's holds out I am sure we will all be very glad indeed. In five years to 1911, in twenty cases of cancer of the cervix, three died from the Wertheim operation and only eight of the seventeen left were alive after five years. We certainly do not know the cause of cancer, and as long as we do not know the cause we must meet the disease in an empirical way, perhaps not knowing the reason why we do this, and if these strong solutions of iodine meet the requirements so much the better for all concerned. I shall be very glad to try Dr. Goodall's treatment in these inoperable cases.

Dr. G. E. Armstrong: I have brought down this cautery to show you. It is constructed to run on a direct current so that I cannot attach it here. It gives great heat and holds it. There are seven or eight attachments of different sizes. The handle does not grow hot but the attachments will keep hot so long as it is in contact with the current. I bought it with the idea of trying it on suitable cases, but so far I have not used it very seriously. In cancer of the cervix it perhaps has a very distinct field, first as a destructive agent to the infection and to the cancer cell afterwards. I have seen it used for the purpose of removing the breast instead of the ordinary scalpel. You go all around the tissues beneath and the contention is that there are fewer vessels to be tied, that you destroy all the cancer cells in the area around and that none of them get into the lymphatics. I am not sure that it is a good thing. I would like to know a little more about it before I use it for cancer of the breast or lip instead of the scalpel. I would not, of course, use it as Dr. Goodall or the gynæcologists would use it, for an hour or an hour and a half; I would use it on an entirely different principle. We theoretically go beyond the area of tissue likely to have cancer cells; the whole thing comes away in one mass. The patients, however, recover much more slowly than with clean-cut operations, where they go home in ten days.

Dr. J. R. Goodall: The treatment that I have outlined is purely empirical. As to the question of its effect upon the cancer cells or merely upon the concomitant infection, I cannot say, but certain inferences may be drawn. We must assume that if the cervix bleeds constantly, giving rise to this discharge, that the carcinomatous cells are on the surface, that the growth is exposed. I have verified this by examination in several cases in which the whole surface was completely cicatrized and there must also have been a destruction of carcinomatous cells as they do not reappear after treatment. What the direct influence of iodine is I cannot say, therefore I have drawn no conclusions but have simply presented facts.

Paper: Some unusual features of surgery of the biliary system, by Dr. E. M. von Eberts.

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ADDRESS ON SURGERY

By Francis J. Shepherd, M.D., LL.D., F.R.C.S.

IT is one of the privileges of age to be reminiscent, and when asked to give this address I thought it would be interesting to look back and see what changes have taken place in the science and art of surgery since I entered as a medical student in the fall of 1869.

It is well for the present generation of surgeons to be aware of the condition of affairs in the pre-antiseptic days and to have some conception of the dangers and difficulties of surgery at that time. What is easy to the present generation was a source of difficulty then and it is well to know that surgery was not born thoroughly equipped as was Minerva, the Goddess of Wisdom and War, Arts and Sciences, when she sprang full grown and completely armed from the brain of Jupiter.

The efficiency of surgery has been arrived at by a slow process of evolution. There had been but little advance in surgery for some time before I entered medicine. Lister was just being heard of in Glasgow as applying Pasteur's germ theory to surgery and trying to find some substance which would destroy the organisms he was convinced were the cause of sepsis and suppuration. But the germ theory was not yet admitted by surgeons in general and especially were the London surgeons opposed to it and even made fun of Lister's antiseptic efforts.

I remember my first experience of surgical responsibility was sitting up at night after an amputation of the thigh, so as to be present and apply a tourniquet in case of secondary hæmorrhage. At that time only one end of the silk ligatures was cut short, the others hanging out of one corner of the flap, chiefly they said, for drainage. During my student days it was rare to have an amputation of the thigh live until the ligature came away on the fourteenth

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Read before the Ontario Medical Association, May 27th, 1915.

day, they usually died of shock or pyæmia the first week; I do not think I ever saw an amputation of the thigh high up recover.

Surgical operations then consisted chiefly in removal of external tumours, amputations for injury or disease, cutting for stone and opening abscesses. The abdomen was a "*mare clausum*" and if by accident the peritoneal cavity was opened the fate of that patient was sealed and the church was his only salvation. Still the surgeons of that day were most skilled operators as they had learned their business in pre-anæsthetic times and it was a common thing to see an amputation of the leg or thigh done in sixty seconds and a complete lateral lithotomy under two minutes. I remember Sir William Ferguson, of King's College Hospital, London, operating in a dress suit with much expanse of shirt front and cuffs and being so clean an operator that he prided himself on never getting a drop of blood on his white shirt. Most operators used an old frock coat which was never cleaned and so was soaked in the gore of many victims. Some washed their hands, others did not, the field of operation was rarely cleansed unless the wound caused by injury was full of dirt. All compound fractures of the leg were amputated at once so as to avoid certain death from sepsis, the only exception was that when the bone had made a punctured wound the wound would be closed by congealed blood and healed in that way under clot.

In my last year of studentship Professor William Fraser, who had spent the summer in England, introduced Lister's method of opening abscesses under lint soaked in carbolic oil. At this time there was no such thing as trained nursing, any old person was employed who thought they had a gift that way, and did their best; many of them imbibed, for at that time every patient was given an allowance of beer, whisky, or port wine daily and the night nurses especially were seldom sober. I remember in the seventies paying a visit to a patient in the hospital on whom I had that morning operated for strangulated hernia. I could not find the nurse at all (she supervised three flats), but my patient I found sitting out on the verandah in his night shirt smoking a pipe and all the obstreperous or delirious patients strapped to their beds. It was a cool evening in the autumn and my patient died of pneumonia some days afterwards.

I do not want to imply that we had no successes for I have seen very many brilliant successful lithotomies, removal of tumours and amputations, and I have even seen healing by first intention. But it was strange that one of our surgeons, a very skilful operator, but who after operating visited his patients but seldom, had better results than his colleague, a much more conscientious man who also was fond of pathology, and liked to see the post mortems on his patients and fussed a good deal over his cases. Needless to say the latter's results were not remarkably good.

We knew nothing about germs at that time and thought that putrefaction was caused by the oxygen of the air. When Pasteur demonstrated that putrefaction was caused by microbes, Lister by his previous work, from his student days under Sharpey, was prepared to welcome this discovery and he says in his Third Huxley Lecture: "Thus was presented a new problem; not to exclude oxygen from wounds, which was impossible, but to protect them from the living causes of decomposition by means which should disturb the tissues as little as is consistent with the attainment of the essential object." Since then it has been proved that putrefaction is not the only cause of serious mischief in wounds, for there are microbes which are odourless and yet produce profound septic effects.

At this period, and for some time after, it was a common thing for the operating room orderly to be also orderly in the post mortem room. Hence the better results of operations performed in the country or private houses than those performed in hospitals. When I visited London in 1873, I found the results of the surgeons fairly good, in fact London and English surgery was always clean and the results excellent for that period, and this is one of the reasons why antiseptic surgery made such slow progress in London. In Germany the surgery of that time was very dirty, and neither personal cleanliness nor the cleanliness of hospitals a distinguishing feature; the results were accordingly bad, hence Listerism was adopted with avidity and the change to antiseptic surgery revolutionized the German methods with such amazing improvement in the death rate that soon they out-Listered Lister.

When I was in Vienna in 1874–5 antiseptics had not yet been introduced and surgical mortality was tremendous. I never saw an operation for strangulated hernia recover, and sepsis prevailed everywhere, even the great Billroth had often disastrous results. Twelve years later when I visited Europe again what a change had taken place! Hospitals and operators clean to excess; operations never hitherto attempted performed successfully, a very low surgical mortality, and surgery invading every region of the body and annexing territory which formerly was thought to be the exclusive domain of the physicians.

In 1874 I visited Edinburgh to see Professor Lister's work, and a great impression it made upon me. John Chiene was then his house surgeon and if I remember aright he manipulated the hand spray of carbolic solution which was used during the operation and dressings. What struck me most was the excessive care of Lister in his dressings, the great attention to detail and cleanliness; and in operating, his great deliberation. The spray was used on the supposition that most of the germs which infected wounds came from the atmospheric dust; when Lister found that the atmosphere was comparatively harmless and that the organisms were on the skin of the patients and the hands and implements of the operator he abandoned the spray. As many of you may remember, the hand spray was replaced by a steam spray. In Germany this was furnished by a large boiler placed in an adjoining room which poured forth carbolic acid spray into the operating room and covered everybody with a thick Scotch mist; in fact one could scarcely see across the room and to protect oneself waterproof clothing had to be worn. This, of course, was German excess. Later von Bruns led a crusade against the spray and *"fort mit dem Spray"* was the cry, and soon the spray was replaced in Germany by irrigation. Niagaras of water were poured over the patient and the field of operation, so much so that the floors were flooded and the onlookers had to get on chairs whilst the operator and his assistants waded through the flood in long rubber boots.

Soon irrigation became out of fashion and aseptic and dry dressings were adopted which in ordinary surgery are used to the present day. In military surgery asepticism is impossible and resort is once more being had to antiseptics with the best results.

The scope of surgery in comparison to what it was forty years ago is enormous—no cavity of the body is now shunned by the surgeon; had such advances been prophesied in the middle of last century the lunatic asylum would have been thought a fit place for the prophet.

As I have said before, one of the great troubles after amputation was secondary hæmorrhage—one saw hanging out of one corner of the stump a number of waxed linen or silk threads; some were on small vesesls, others on large, and the surgeon making his rounds looked at the stump and pulled at one or other of these threads to see if they had ulcerated sufficiently to come away. Very often with the ligature came a gush of blood. This secondary hæmorrhage required the reopening of the stump and the vessel secured, no easy matter with the instruments then in use and on a suppurating granulation surface. Sir James Y. Simpson, to do away with ligatures and their dangers introduced what he called acupressure, a method to compress arteries by means of metallic needles introduced in various ways. At the same time Lister began to cut both ends of his ligatures short and leave them to their fate buried in the tissues; this was before he introduced absorbable ligature of catgut. Although good results were obtained from acupressure, and many cases of healing by first intention were reported, yet Lister's ligatures won the day and soon Simpson's method passed away and is now quite forgotten.

Abdominal operations are now as safe as any other major cases and our knowledge of germs, how to control their evil effects and to prevent their invasion, makes most operations in surgery comparatively without much risk. Appendicitis, or inflammation of the bowels as it was called, was thought to be a rare disease and was not considered at all surgical. The common medical term was typhlitis, with peri- or para- as additions. It was thought to commence in the cellular tissue around the cœcum or typhlus, or cœcus. In a short time our greater knowledge of pathology properly placed the blame on the appendix. Operations were then rarely performed except for peri-typhlitic abscess. At first operations were never undertaken unless pus was found by the exploring needle, and the search for the appendix was always a matter of difficulty. The first twelve cases I operated on all died because I was only called in to operate when the physician thought he could do no more; then the surgeon was the "dernier ressort." At this time diagnosis was not easy and appendicitis was often mistaken for typhoid. It seems absurd now to know with what difficulty physicians and surgeons diagnosed this disease and then only after many anxious and serious consultations, whilst now every man and child in the street could make a diagnosis from a verbal description of the case. But so it is, and what is difficult and obscure in one generation often becomes simple and clear in the next.

It is strange to look back and see the gradual growth of abdominal surgery; at first the only operation on the abdomen was an obligatory one, viz. for strangulated hernia, and this was done with serious forebodings. Soon operations were performed for ovarian tumours and ovaries without tumours, and successfully carried out by Lawson Tait, Spencer Wells, Keith and others. In fact, we are indebted largely to Lawson Tait for his pioneer work in abdominal and especially pelvic surgery. Ovariotomies, since MacDowell's famous case, were performed from time to time with occasional success, but when I studied in London, every case I saw operated on proved fatal. With our knowledge of the germ theory and with the introduction of Listerism the obstacles to recovery were removed and ovariotomy became a common and safe operation. Surgeons rapidly adopted Listerism and "boomed" it and in a short time were doing all the operations hitherto only suggested, such as excision of the stomach, intestines, kidney, spleen, etc. From pest houses German hospitals became sanitariums and as the *Lancet* of August 13th, 1881, observed at the time, "our admiration for the change effected is only equalled by our horror of previous conditions." Many German surgeons advocated the compulsory use of antiseptics and Professor Nussbaum, in 1881, suggested the following law: "Any person summoned to heal an accidental case or wound, must no longer close it up with an adhesive plaster, nor examine or disturb it with a finger which has not been disinfected; but after the surgeon has washed his hands and the wound with some disinfectant (for which purpose a 5 per cent. solution of carbolic acid seems to be the most convenient), the wound must be thoroughly protected with an antiseptic dressing. Such dressing may consist of carbolized jute or wadding, chloride of zinc wadding, or some other well-known antiseptic material."

Simon first removed the kidney designedly in 1869. In 1881 an occasional excision of the kidney is reported and papers were read on the subject at the International Medical Congress in London in 1881. I think it was Mr. Henry Morris who first successfully removed a stone from the kidney where there was no suppuration (in 1880). I first excised a kidney successfully in 1884 and a stone in 1886. My first gall stone operation was in 1890.

It is interesting to look back on the past literature and to study the conditions of surgery at that time. In 1888 I gave the surgical address before the Canadian Medical Association in Ottawa and spoke among other things of the surgery of the abdomen and the information given below is extracted from that address: "It was strongly advised that all cases of intestinal obstruction be handed over to the surgeon and not kept on medical treatment by the physician until it was too late to operate." Surgical treatment was recommended in all cases of suppurative appendicitis and a few advanced surgeons advocated early operations. Typhoid perforations were being occasionally operated upon, always with fatal results. It was found out accidentally when operating for tumour in a mistaken diagnosis that tubercular peritonitis could be cured by opening the peritoneal cavity. Perforating gunshot wounds of the abdomen were being immediately operated upon. Radical cure of hernia was becoming a safe and fashionable operation. The surgery of the gall bladder was looming up as an accepted and successful fact. Lawson Tait reported thirty cases of cholecystostomy with one death. Credé, of Dresden, had had only five cases with one death, and Langenbuch, of Berlin, had collected seventy-five cases of cholecystotomy with two relapses, eleven deaths, and sixteen cases with fistula resulting. He advised against operation when the stones were in the common duct.

Occasional cases of operations on the stomach, intestines, spleen and pancreas were reported but with few successes. The operations of nephrectomy and nephro-lithotomy had become well established. In 1888 prostatic surgery was yet in its fatal infancy, though tumours of the bladder were being operated on. In other departments of surgery, the brain and spinal cord were fields of operation just becoming known through the work of Victor Horsley, Keen, Macewen, Weir and others.

Surgery is still advancing and is enlisting more votaries than ever, nearly every new graduate wishes to become a surgeon. Every small place has now a well equipped hospital with excellent facilities and every opportunity is offered for the prosecution of the art of surgery. I am afraid there is often more art than science and much unnecessary operating because now most operations are comparatively safe. There is something more than mere mechanical skill needed by surgeons. The most important attributes of a surgeon are judgement and knowledge when to operate and when not to operate and when to stop—mechanical knowledge of surgery can never teach this. I remember some years ago visiting a small town west of Montreal, and operating in a well appointed little hospital, where I was shown no less than four cases of extirpation of the uterus operated on by four different surgeons, all I am happy to say convalescing (the patients, not the surgeons). What amazed me was that there should be such a necessity for so many such operations in so small a place. In our own large hospitals in Montreal I had never seen so many cases together in the gynæcological wards. I remember hearing of another case where a good surgeon in a large city of the United States operated for appendicitis on the only child of very prominent people. After removing the appendix, as the cæcum, or what they thought was the cæcum, was full of fæces, it was opened and the fæces evacuated and then the wound was closed. A few days later a fæcal fistula appeared which would not close. The boy's condition from the continuous drain and irritation became bad and an anastomosis operation was advised and done. Still the fistula continued and he grew rapidly worse. He was brought to Philadelphia and a prominent surgeon was consulted, who told me the tale. An exploratory incision was made but nothing could be done as there was so much agglutination of the intestines and the boy's condition so serious. At post mortem it was found that the appendix was still in situ and had never been removed. It was the upper part of the ileum and not the cæcum from which the fæces had been evacuated and which was fistulous, but the anastomosis of the ileum with the colon had been a perfect success. Hence you see here a well marked case of technical skill without knowledge. I could relate many analogous cases, but refrain.

As long ago as 1887 Professor Bergmann, at the German Scientific Medical Association, spoke the following impressive pregnant words which are applicable even to-day. He said: "There is more or less rivalry between medicine and surgery in the case of disease, but further progress in surgery can only take place through an increased knowledge of internal medicine. Surgeons must now avail themselves more of the accurate means of investigation which one owes to physicians, auscultation and percussion, thermometry, chemical, microscopical and electrical investigations. As long as internal medicine remains guardian of scientific medicine and scientific principles, so long will it remain the parent tree of which surgery is only the branch. . . . It follows from what has been said that surgery owes all its recent development to clinical medicine and just as antiseptic treatment is the product of careful observation in etiology, so the energetic procedures of internal surgery will have successful results only when firmly established by the methods of clinical medicine; otherwise surgery will sink in the hands of expert specialists to a mere display of manual dexterity."

Surgeons soon felt that they could not be good internists and have a competent knowledge of all branches of surgery, so this has led to team work in private and public hospitals which makes for such efficiency and enables the surgeons to do an enormous amount of work. This method, however, is apt to make the surgeon a mere operating machine and may not work out for the entire good of the profession. It is better for a surgical department to have a head who has gone through all the stages of medicine including a sound course in pathology and pathological chemistry and who has a good training in clinical medicine. Of course, his department is equipped with a staff of specialists in pathology and chemistry but he himself should be the guiding hand and suggest and direct the work to be done. It goes without saying that everyone who practises in the country must do some surgery but he should not attempt it without having had some hospital training as a surgical interne after graduation. The tendency of the younger surgeons is to look upon the older man as having had no proper training, they call us pre-scientific and seem to think that laboratory methods are everything. I remember a pathologist giving a lecture to the incoming students in a medical school and he told them that laboratory methods had supplanted all others, including experience which the older men prided themselves upon. I had happened to have had some ten days before a serious gunshot wound of the arm in a boy where the brachial artery and biceps muscle and some of the nerves had been shot away, where in fact the whole arm was shattered. He had pulled the gun to him by the barrel when it went off. The whole forearm was wax-like, bloodless, cold and absolutely no circulation existed. I was advised to amputate immediately by a colleague but refrained, and after treating and dressing the wounded arm wrapped the extremity in layers of cotton wool. In twenty-four hours there was a slight flush in the fingers and in three days the limb was warm and afterwards the case went on well. Now I asked my friend the lecturer how he could tell by any laboratory method whether to amputate or wait. Of course, he could give no answer and no doubt he thought he was quite right, but he had never practised surgery and had never been up against a case which required judgement and experience and yet he was quite willing to speak "ex cathedra" to men who were going to practise medicine and surgery. I may say the boy alluded to has a most useful right arm with which he can play a good game of tennis. As the Psalmist says, "I am wiser than the aged" so say the younger men of every generation, but remember what Huxley says: "we are none of us infallible, not even the youngest." I admit as we get older we become more conservative and perhaps procrastinate, but this is the infallible result of long experience.

How many methods have we older men seen come and go, lauded to the skies by eloquent advocates both in societies and journals; we often hear of remedies and methods by which every case is cured, and dozens who have made use of them print undigested articles confirming the originators' views and improving on them; some would find them only suitable on selected cases, and finally this remedy or method is forgotten because it is of no value and could not stand the test of experience as Byron said in his poem, "English Bards and Scotch Reviewers";

"Thus saith the Preacher: 'Naught beneath the sun is new
What varied wonders tempt us as they pass?
The cow-pox, Tractors, galvanism, gas,
In turn appear to make the vulgar stare
Till the swoll'n bubble bursts and all is air!'"

Although I am as much an advocate of laboratory methods as the most scientific younger surgeon, yet they should not replace those powers of observation which are the great asset of the medical man. I fear a tendancy to do so, for the recent graduate dares not diagnose a fracture without *x*-rays, a typhoid fever without a Widal, syphilis without a Wassermann, and so on. We cannot always carry a laboratory or hospital appliances about with us so we should not depend too much on the use of mechanical means in diagnosing disease and should not let our powers of observation atrophy. Time, no doubt, will remedy this state of affairs and things will bear their proper proportion to one another. Some are very sceptical that this will occur and think there is nothing true or sure but mutability, as Moore says,

"This world is all a fleeting show
For man's illusion given;
The smiles of joy, the tears of woe,
Deceitful shine, deceitful flow,
There's nothing sure but heaven."

For the sake of the wounded in the present awful war it is fortunate that surgery has attained such a high pitch of efficiency and that hospitals are now so well arranged and managed. What a contrast to that which existed in the Crimean War when Florence Nightingale did so much to clean out the Augean stables whose doors were closed with red tape. Now from the field to the base hospital everything is done for the wounded in the quickest possible time and in the most skilful manner and the proportion of recoveries is proportionately large. I am glad that Canada is doing so well and is so eager to establish hospitals. The universities deserve great commendation for the way they have come forward to man the various hospitals with their best teachers, best surgeons and physicians and specialists. All honour to them and to the Canadian nurses and students who go with them. We are all sure the work will be well and scientifically done and reflect credit not only on the British Empire, but on the whole of Canada and its professional men and women. May God go with them and prosper them!

APPENDICITIS: AN APPRECIATION OF THE OCHSNER METHOD

By Everett S. Hicks, M.D.

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A VISIT to the Ochsner clinic in Chicago convinced me that it is a mistake to be rash in operating, at sight, on many cases and that at times the statement "that the operation was too late" might be qualified by the addition "or the time for operation badly chosen."

In reporting two hundred consecutive cases of appendicitis without a death the points of interest are:

1. Sixty-four cases were not treated surgically during the acute attack.

2. One hundred and thirty-six were operative cases. Of these forty-nine were acute cases operated on as soon as they came under observation—twelve were pus cases of whom eight had an abscess drained only, and four had both abscess drainage and removal of appendix, while eighty-four were of the chronic type or were operated after the acute attack had well subsided.

3. Principles of treatment. The medical treatment if it can be called such was prohibition of food, physic, and generally of water. Lavage at times. Rest in bed. Mild heat locally. All cases seen in the first forty-eight hours were operated on at once if willing, a few were operated on on the third day, but cases from the fourth to ninth days, were, especially if very ill, treated medically and a safer time waited for.

When one states that the cases were divided between country practice, private hospital, and city hospital work the Ochsner treatment can be commended as a safe and practical outline for guidance even under such varying conditions.

BACTERIOLOGY OF HODGKIN'S DISEASE

A Review

By Lawrence J. Rhea, M.D.

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WHATEVER is presented as the possible cause of any disease, the etiology of which has not been definitely established, is worthy of careful consideration, provided the investigations upon which the suggested etiology is based have been done with the care that scientific medicine of to-day demands. This is especially true when, as the result of such investigations, there is offered a specific cause for one of the pathological conditions that has been classed by some of the most careful workers as belonging to the group of true tumours.

I wish to discuss this evening the present status of the bacteriology of one of this group of pathological conditions—Hodgkin's disease.

Since Hodgin isolated from the lymph node hyperplasias, a group which clinically and pathologically fulfilled certain conditions, the pathological study of this group now known as "Hodgkin's Disease" has largely centred around three chief points: (1) The relation of these hyperplastic nodes to neoplasms; (2) their relation to the tubercle bacillus, and (3) the presence or absence of a specific cause for them.

The finer histological studies of the lesions in the lymph nodes in Hodgkin's disease, have generally been interpreted in one of two directly opposed ways: (1) that the characteristic changes are those of a true tumour whose essential cellular elements belong to the lymphatic series of cells; (2) that the histological changes found in these nodes are not those found in true tumours, but on the other hand are to be attributed to some irritating agent or agents the tissue reactions to which result in a chronic inflammatory change of a special, though not absolutely uniform type. The

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Read before the Montreal Medico-Chirurgical Society.

supporters of these two views then have referred to the histological findings in the lymph nodes as evidence in support of the conclusions reached. Those who would have you interpret Hodgkin's disease as a true tumour primary in the lymph nodes, would place it in the group of lympho-blastomas; while those who interpret the histological picture as that of a chronic inflammatory nature, would have you accept some known or unknown, though specific, type of irritant as the causative agent. Among those who have held that Hodgkin's disease is a special type of chronic inflammatory reaction, are, Longcope, McCallum, and Dorothy Reed. In his recent textbook Professor Adami expresses the opinion that the lymph node changes in Hodgkin's disease are not those of a true neoplasm, but are of a chronic inflammatory nature.

The relation of tuberculosis to Hodgkin's disease has been thoroughly studied, and the consensus of opinion in regard to this relation may be summarized as follows: Hodgkin's disease is neither the result of the toxine of the tubercle bacillus, acting directly upon the lymph nodes themselves, nor is it the result of toxic substanc [illegible]ined into the lymph nodes from some adjacent focus of tuberculosis. The two diseases may, however, occur in the same individual, and may even involve the same lymph node. When one considers the great prevalence of the lesions due to the tubercle bacillus, the presence of such lesions in the hyperplastic nodes in Hodgkin's disease is to be expected, if a sufficient number of cases of this disease are studied. There are few pathological conditions that are not in some instances complicated by the presence of lesions produced by the tubercle bacillus.

There has always been an active interest in the bacteriology of this disease, but only comparatively recently have any encouraging results been obtained. These results have not come by accident but have been made possible by the increasing co-operation between the clinician and the pathologist, and by the application of newer and better bacteriological technique. Comparatively recently Frænkel and Much have published an article upon certain microscopical findings in the lymph nodes in this disease. These authors treated the lymph nodes from thirteen cases of Hodgkin's disease with antiformin, and made a microscopical study of the material remaining after this treatment. In twelve out of the thirteen cases they were able to demonstrate organisms which they thought were tubercle bacilli, or organisms closely related to them. These findings are of interest as they bring before us again the relation of the tubercle bacillus, or organisms closely simulating it, to Hodgkin's disease.

The more recent workers upon the bacteriology of Hodgkin's disease have interested themselves not so much with the morphology and staining reactions of bacteria, obtained in smears and sections made from the nodes, as upon cultures made from them. Negre and Mieremet report the results of cultures made from the lymph nodes in two cases of Hodgkin's disease. From each of these cases they isolated an organism which closely resembles the one to be described later.

During the past two years Bunting and Yates have been actively interested in Hodgkin's disease, and have published several articles upon the subject. These publications have dealt with several aspects of the disease, but I wish to refer to but one of them, —its bacteriology.

Bunting and Yates have isolated a diphtheroid organism from the lymph nodes removed from a number of cases of Hodgkin's disease, and have studied the cultural and staining characteristics as well as the pathogenic properties of this organism. The patients from whom the lymph nodes were removed showed the clinical signs and symptoms of Hodgkin's disease, and the lymph nodes themselves showed the pathological changes found in this disease. Their own interpretation of the results obtained from their bacteriological studies can best be illustrated by the following summary:

From three out of five cases in which a bacteriological examination has been made, a diphteroid pleomorphic organism has been isolated in pure culture. In the remaining two cases this organism was recognized but was not recovered in pure culture. "The morphology, cultural and staining reactions of the organisms recovered from these cases are briefly as follows: They are facultative anærobes, Gram-positive, not acid-fast, and vary greatly in their morphology, depending on a number of factors, e.g., their age, the medium employed, and the fluid content of the medium. Pleomorphism is a pronounced feature; coccoid forms, long forms, beaded forms, and club-shaped involution forms are present. Branching forms are present, especially on the egg medium; on certain media polar staining forms are present. Plate cultures show rounded, glistening, grey colonies which at the end of twenty-four hours gradually become opaque white. There is a central dark spot in the colony and a fine stippling of the growth."

Since the publication of the article from which the above quotation is taken these same investigators have reported the results thus far obtained by inoculating animals with the diphtheroid organism they have isolated. They report that they have been able by repeated inoculations, not only to infect monkeys (Macacus rhesus) but these animals have shown a blood picture typical of that of early Hodgkin's disease, and later have developed chronic lymphadenitis that corresponds grossly and microscopically with Hodgkin's disease of the same duration in man. They have not only succeeded in producing these gross and histological changes in the monkey, but they have recovered from the enlarged lymph nodes a diphtheroid organism similar in every way to the organism injected. In one of their articles they say:

"Thus, since our experiments demonstrate that the diphtheroid organism is pathogenic for monkeys, that it produces a progressive enlargement of the lymph nodes with lesions similar to those of Hodgkin's disease in man, and further, that the blood changes in the monkey are similar to those in man, we feel fully assured of the etiological relationship of the diphtheroid organism, *Bacterium Hodgkini*, to Hodgkin's disease."

Bunting and Yates thus make clear their attitude toward the organisms they have isolated and studied.

In a paper recently published by Bunting, in which he summarises his own work upon this disease, there are two points that are important in relation to his own idea of the disease in question and their bearing upon the observations of others, to which reference will later be made. Bunting states that a careful search will, in the majority of cases, reveal a primary inflammatory lesion, and that this lesion will be found to have been present before the enlargement of the lymph nodes occurred.

While these primary lesions are most frequently in the mouth, the tonsils and the nasal passages or their sinuses, they may occur elsewhere. In one case primary in the lymph nodes in the inguinal region, a cystitis had preceded the glandular enlargement. In those cases where the lesions are confined to the mesenteric lymph nodes and lymphatic tissue of the intestine, Bunting believes that the primary source of infection is through the mucous membrane of the gastro-intestinal tract.

If we are to accept *Bacterium Hodgkini* as the specific cause of Hodgkin's disease, the observations made by Bunting in regard to the presence of a primary lesion outside the lymph nodes are important ones. The importance is readily understood when we recall the relation of bacterial invasion of lymph nodes in general. Rarely are they primarily infected by bacteria. So frequently is their involvement secondary to some primary focus elsewhere tha an infected lymph node to the surgeon means a most careful searc for the primary lesion. Very much the same attitude is taken i the post-mortem room.

Bunting's view in regard to the frequency and importance o a primary source of infection without the lymph nodes has offere to him the suggestion that surgical procedures in this disease ma do harm to, rather than benefit, the patient. He says: "So i Hodgkin's disease, the primary group of glands for a considerabl length of time protects the body from the toxins elaborated by th infectious agent. The removal of that group of glands—the infected ones—by its ultimate sclerosis or by the hand of the surgeon while the primary focus remains intact, exposes the body to a extension of the process to further glandular groups, and eventuall to an anæmia and cachexia."

Billings, of Chicago, in a paper on "Mouth infections as source of systemic disease" refers to five cases of Hodgkin's disease in each of which the x-ray showed the presence of an alveola abscess. From these abscesses *Bacterium Hodgkini* was isolated

Besides the work of Bunting and Yates, the results of the investigations of others upon the bacteriology of this disease hav already been reported or reference made to them in the discussion of certain papers.

E. C. Rosenow in a recent paper on "The newer bacteriolog of various infections as determined by special methods," state that he has isolated a diphtheroid organism from the blood of fou cases of Hodgkin's disease during the febrile stage of the illness He also refers to his having isolated a diphtheroid organism fro the hyperplastic lymph nodes of a number of patients. In th discussion of this paper and one given by Billings at the sam meeting, Billings states that the lymph nodes from which Roseno isolated a diphtheroid organism were not all alike histologically Some of them were typical of Hodgkin's disease; others were lymphocytoma or tuberculosis.

Libman, in discussing a recent paper, refers to the results o Cellar, who found an organism very similar to the one describe by Bunting and Yates, not only in Hodgkin's disease but in othe types of lymph node hyperplasia as well. Two of the cases wer typical tuberculosis. Libman also spoke of an investigation no being done in the laboratories of the Mount Sinai Hospital upon th application of the complement fixation test in Hodgkin's disease In no case has this test been positive. Stengel, on the other hand in discussing a paper, says: "It seems to me we are sure this organism is the specific organism in Hodgkin's disease."

Dr. E. H. Falconer, now of the Medical Department of the University of California, and myself, have had the opportunity of making a bacteriological examination of the lymph nodes from one case of Hodgkin's disease. This opportunity was made possible through the co-operation of Dr. J. M. Elder, into whose service the patient was admitted. We were informed of the presence of the case in the hospital and given ample time to prepare the special media and materials for carrying out the technique to be used. When Dr. Elder was to remove several glands for diagnosis we were present and the special glands to be removed were selected by us. The very strict antiseptic precautions we requested were scrupulously carried out by him. By this means we obtained not only the exact tissue desired but obtained it in such a way and at such a time as was best suited to us.

The clinical aspect of this case, including the blood picture and the gross and histological findings in the lymph nodes, corresponded to that found in Hodgkin's disease. The results of our work upon this case, as it bears upon the bacteriology of Hodgkin's disease, may be summarized as follows:

An organism similar to that described by Bunting and Yates has been recovered in pure culture from the lymph nodes in this case and also found in stained smears and sections made from them. This organism has been injected into monkeys without any definite result. The negative results of these inoculations cannot be considered as conclusive evidence in support of the non-pathogenicity of *Bacterium Hodgkini* for monkeys. Not all of Bunting and Yates' cultures were pathogenic for monkeys. Their positive results seem to have resulted from the high virulence which one of their organisms had attained.

While neither Dr. Falconer nor myself claim that the organism we have isolated is the specific cause of the disease in question, we feel sure of at least two points: (1) That the organism we have isolated came from the lymph nodes, and (2) that it was in the nodes at the time Dr. Elder removed them.

The knowledge of the presence of a group of diphtheroid organisms does not date from the discovery of a member of this group in the lymph nodes in Hodgkin's disease; they are well recognized and have been especially studied in their relation to *Bacillus Diphtheriæ*. They have also been found in the lesions present in leprosy, as well as in the lymph nodes draining these lesions. In the laboratory of the Montreal General Hospital we have for some time recognized the presence of a member of this group in the genito-urinary tract. Recently my assistant, Dr. Scott, has isolated it from the urethra of several cases, some with and some without acute lesions.

One of my recent colleagues in the Peter Bent Brigham Hospital, Boston, Dr. Walker, informs me that he has recovered a diphtheroid organism culturally similar to that described by Bunting and Yates, in a blood culture from a patient without any signs or symptoms of Hodgkin's disease. A second blood culture from this patient was sterile. He is of the opinion that the organism in this particular case is to be looked upon as a contamination.

From this brief review of the present status of the bacteriology of Hodgkin's disease the following conclusions seem to be warranted:

1. Bacilli have been found in smears and sections made from lymph nodes in Hodgkin's disease.

2. A diptheroid pleomorphic organism has been isolated in pure culture from the lymph nodes of a number of patients who showed the clinical signs and symptoms of Hodgkin's disease, and whose lymph nodes, grossly and microscopically, correspond to those found in this disease.

3. A diphtheroid organism has been cultivated from the hyperplastic lymph nodes found in diseases other than Hodgkin's disease, among them cases of tuberculosis.

4. A diphtheroid organism has been recovered from the circulating blood in cases of acute Hodgkin's disease.

5. A similar organism has been isolated from focal lesions in the mouths of patients suffering with Hodgkin's disease.

6. Those who have worked upon the bacteriology of this disease, or who have expressed an opinion concerning such work, fall into two groups. In the first group are those who, with Bunting and Yates, believe the *Bacterium Hodgkini* is the specific cause of Hodgkin's disease. The second group consists of those who welcome the work thus far done upon the question, but at present take an attitude of "watchful waiting."

THE PRACTICAL VALUE OF A KNOWLEDGE OF THE SYMPATHETIC AND AUTONOMIC NERVOUS SYSTEM

By J. W. McIntosh, M.D.

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IT seems rather anomalous that while internal medicine is much more concerned with the viscera than with the rest of the body, the importance of a knowledge of its nerve supply has been considered in inverse ratio with that of the cerebro-spinal system. Only recently has this field revealed an interesting and complex mechanism which is shedding light on the functions of the organs themselves, and on the body generally. While much still remains in darkness, enough has been elucidated to make it impossible in the time at my disposal to do more than call attention to the practical applicability of some of the findings. To do so, however, it will be necessary to give a brief outline of the subject in its broad aspect.

The nerve supply to the sense organs and the voluntary muscles comprises the cerebro-spinal or animal or somatic system. The involuntary or automatic supply to the internal organs containing the involuntary muscle fibres or secreting glands is the sympathetic or vegetative or visceral nervous system, including the smooth muscles of the stomach and intestines, genital apparatus, the blood vessels, skin and eye; also the sweat, lachrymal, salivary, mucous, gastric and intestinal glands and the liver, pancreas, kidneys and glands of internal secretion.

The sympathetic nervous system is composed of a chain of serially disposed ganglia, bound to each other by intervening nervous cords and placed one on either side of the vertebral column from the base of the skull to the coccyx. In addition to these gangliated cords, the sympathetic system includes certain dense plexuses of nerves and numerous scattered ganglia. The whole is most intimately connected with the cerebro-spinal nervous system.

Morphology. Considering its structure, functions and development, there appear to be two separate structures represented in the

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sympathetic nervous system—the spinal and the sympathetic elements, a union of two distinct elements—fibres of cerebro-spinal origin and sympathetic cells and fibres. These possess a vital activity, apart from their connexion with the central nervous system.

It is essentially a longitudinal cord or column, associated with involuntary muscles and glandular tissues and particularly related to the organs in the splanchnic area—not truly segmental, only quasi-segmental. Even its grey rami assume a segmental character in consequence of their connexions with the spinal nerves.

The sympathetic system is likely the representative of an ancient architecture independent of the cerebro-spinal system. From every point of view it is differentiated from the cerebro-spinal system, though inextricably united with it and subservient to it. While the cerebro-spinal system is in control, yet it is directly subject to the sympathetic, for if there is abuse of power, the worker suffers—the viscera deteriorate and the central nervous system in turn suffers as a consequence.

At the cephalic end each sympathetic cord is continued in a plexiform manner into the cranial cavity along with the carotid artery. At the caudal end the two are connected by the coccygeal ganglion.

The centripetal or afferent paths of the sympathetic are still not well understood; the centrifugal or efferent paths are fairly well known.

In the cerebro-spinal nerves the axis cylinder of a single neurone stretches from the anterior horn cell to the muscle ending, without interruption.

In the sympathetic there are at least two neurones in the path from the smooth muscle or secreting gland to the cerebro-spinal axis. Thus of the two neurones connecting the spinal cord with a viscus the first has a cell body in the spinal cord, and its medullated axone—the preganglionic fibre—runs through the anterior root of a spinal nerve and through the white ramus communicans, into the sympathetic system, sometimes passing through several sympathetic ganglia to terminate in an end-arborization upon the cell-body of the second neurone of the path, in some sympathetic ganglion. The axis-cylinder of the second neurone is non-medullated and is called the post-ganglion fibre; it goes from the ganglion to innervate the smooth muscle fibre or secreting gland. A substance called myoneural or adenoneural intervenes between the nerves and the muscle or gland. Barker says it is in this medium that the ions of sodium calcium, etc., exercise important functions.

The visceral nerves are intermediate between the cerebro-spinal system and the internal organs. Both the central nervous functions and the visceral functions are largely dependent upon those of the visceral nerves. The visceral nerves are therefore dependent both upon the regulating messages from the cerebro-spinal system and the controlling action of the internal glands and other parts of the body, excited chemically through hormones and other products. This then is one method in which the internal glands may control the viscera. The action of the internal glands on non-striped muscle and secreting gland is also much influenced by the nature and amount of basal ions present, especially those of calcium, magnesium and sodium.

The two divisions of the Sympathetic. Many of the viscera have long been known to have a double nerve supply. For example the sympathetic innervation was known to accelerate the heart rate and the vagus to inhibit it: the sympathetic to inhibit the smooth muscle fibres of the gastro-intestinal tract, and the vagus to stimulate it: the sympathetic to dilate the pupil and the oculo-motor to contract it.

Recently it has been shown that this double antagonistic nerve supply holds throughout the whole body for all smooth muscles and secreting glands, and that there are afferent and efferent paths in each system.

Langley calls the two systems taken together the autonomic system. Writers recently, however, favour limiting the name autonomic or vagatonic to those parts of the system which are connected chiefly with the mid-brain through the oculo-motor nerve, with the medulla-oblongata through the vagus and glosso-pharyngeal, and with the sacral part of the spinal cord through the pelvic nerve. The sympathetic is then reserved for the old sympathetic system connected as shown above chiefly with the cervical, thoracic, and lumbar portions of the spinal cord.

It has been further shown that each of these systems carries two sets of fibres, one favouring and the other inhibiting the main function of each system.

Some organs, for example, in the intestinal canal, the plexuses of Auerbach and Meissner, have a nervous mechanism of their own, only partly subservient to the autonomic and sympathetic systems. It is just possible that this represents a still older system than the sympathetic proper.

The antagonistic action of the two systems as to symptoms is shown in this table:

(It will readily be understood that a hyperaction of one system will give symptoms similar to a hypoaction of the other.)

SYMPTOMS OF HYPERACTION OF SYMPATHETIC OR HYPOACTION OF AUTONOMIC OR VAGOTONIC	HYPERAUTONOMIC OR VAGOTONIC HYPOSYMPATHETIC
Pupil—Dilatation.	Contraction.
Ciliary muscle—	Accommodation spasm.
Lev. palpabræ (unstriped pt.)—Wide lid slits.	Narrow lid slits.
Muscle of Müller—Exophthalmos.	Enophthalmos.
Saliva—Inactive.	Free flow.
Oral blood vessels—Dilate-congestion.	Contract—pale.
Cerebral blood vessels—Contract—mentally inactive	Dilate—mentally active.
Cutaneous blood vessels of head—Constricted—pale face.	Dilated—red face.
Lachrymal glands—Inactive.	Free flow.
Sweat Glands—Inhibited—dry skin.	Stimulated—moist skin.
Mus. arect. pilorum—Stimulated—hairs erect.	Paralyzed—hair flat.
Heart muscle—Stimulated—rapid pulse.	Inhibited—slow pulse.
Coronary blood vessels—Dilated.	Constricted—tendency to angina pectoris.
Intestinal blood vessels—Constricted.	Dilated.
Oesophagus—Relaxed.	Contracted.
Cardia—Paralyzed.	Excited—cardiospasm.
Stomach tonus—Diminished (e.g. acute dilatation of stomach).	Increased.
Stomach peristalsis—Paralyzed.	Increased.
Stomach secretion—Diminished—hypoacidity (HCl).	Increased—hyperchlorhydria.
Pylorus—Paralysis—regurgitation.	Increased—pylorospasm.
Intestinal motility—Paralysis—stasis.	Excited—hypermotility or enterospasm.
Colon—Relaxed—constipation.	Excited—diarrhœa or spastic constipation.
Sphincter ani—Relaxed.	Anal cramps.
Gall bladder—Relaxed.	Contracts—good bile flow—nervous biliary colic.
Pancreas secretion—Inhibited—glycosuria.	Excited—carbohydrate tolerance.
Bronchial muscles—Inhibited—care inhalation pneumonia in anæsthesia.	Excited—spasm—tendency to asthma.
Sphincter vesicæ—Contracted—tendency to retention.	Relaxed—inc. frequent micturition—tendency to incontinence.
Detrusor vesicæ—Relaxed—tendency to retention.	Contracted—inc. frequent micturition—tendency incontinence.
Uterus (pregnancy)—Contracts.	Relaxes.
Uterus (gravid)—Relaxes.	Contracts.
Mus. retract. penis—Contracts.	Relaxes.
Sugar tonus—Increases.	Diminishes.
Heat tonus—Increases.	Diminishes.
Pigment cells—Contract.	Expand.
Hands and feet—Warm and dry—dermographia, etc.	Cold and moist.
Eosinophil count—Low.	High.

Organic motor reflexes. The observation of the sympathetic reflexes is useful also in this study. They are:

Cilio-spinal	Pinch or scratch skin of neck.	Pupil dilates.
Scrotal	Stroke or apply cold to perineum	Dartos contracts.
Internal anal	Distention of anus by finger	Int. sphincter ani contracts.

REFLEX CENTERS NOT IN THE CORD AS FORMERLY TAUGHT

Vesical	Distend or irritate bladder or perineal urethra or from cerebrum.	Bladder wall contracts.
Rectal	Distend or irritate upper part of rectum	Rectum wall contracts.
Genital	From cerebrum or periphery	Corp. Cav. Erec.
Uterine	Distention or irritation of uterus	Uterus contracts.

In the average healthy individual there is maintained an equilibrium between these two systems, the autonomic and sympathetic, subject to all the physiological variations and physical needs of the body. This balance is kept up through the constant stream of stimuli arriving by the nerve paths and also by the direct chemical actions on the system, of hormones from the internal glands or elsewhere. The points of possible intervention are so innumerable and the variety of stimuli is so great that it seems hopeless ever to be able always to diagnose accurately either the point or nature of the intervention.

In marked variations from the normal one finds many cases which show a pronounced tendency to an over or under action of one or other system and by keeping in mind the symptoms of hypertonus or hypotonus of the sympathetic or the autonomic system one finds many individuals who may be classed either as having a vagotonic or autonomic constitution or a sympathicotonic constitution. Eppinger and Hess were the first to establish the clinical conceptions of vagotonia and sympathicotonia, and Barker and Sladen have made quite a clinical study showing the frequency of the occurrence of pronounced classes, especially in neurasthenics, hysterics and psychasthenics and in disturbances of the thyroid, pituitary, adrenal and genital glands. There are, however, many patients who show pronounced over or under action of one or other system in only one place or in more. There are likewise mixed cases showing for instance sympathicotonic symptoms in one organ and vagotonic symptoms in another.

A vagotonic (or autonomic) constitution shows:

1. Various clinical symptoms indicating hypertonus in the cranio-sacral autonomic system.
2. Hypersensitiveness to pilocarpine administration.

3. Relative insusceptibility to sympathetic stimuli and therefore a tolerance for adrenalin.

A sympathicotonic constitution shows:

1. Various clinical symptoms and signs of hypertonus in the sympathetic system proper.
2. Hypersensitiveness to adrenalin administration.
3. Relative insusceptibility to pilocarpine and atropine.

Electrical stimulation. The effects of electrical stimulation of the two autonomic systems is to get the physiological results known to ensue in each system by an activity of the nerves concerned. In other words electrical stimulation of the sympathetic or vagotonic nerves gives the symptoms and signs of a hyperaction of each respectively as given in the table of symptoms and is similar to a chemical stimulation, as by the drugs which are known to have specific action on the separate systems.

Drugs. Some of the drugs having a specific effect on one or other system:

Curare has a paralyzing effect on the nerves of the voluntary muscles only and therefore is of no service in the study of the sympathetic.

Atropine on the other hand is known to paralyze the endings of the vagotonic or autonomic nerves, having a chemical selective action thereon and no action on the voluntary muscular system. For a single test 1-50th to 1-100th grain is used hypodermically. It acts more on the head and heart than on the caudal organs, having little effect on the sacral autonomic fibres innervating the pelvic viscera.

Pilocarpine stimulates the vagal or autonomic system. Its maximal action is on the secretory fibres, having little effect on the cardio-inhibitory fibres. It may be used grain 1-6th to 1-20th hypodermically.

Digitalis also stimulates the vagal system.

Choline from the cortex of the adrenal glands antagonizes epinephrin from the medulla and stimulates the vagotonic or autonomic system.

Nicotin acts on both systems, interrupting conduction at the synapse, i.e., the junction of the pre-ganglionic fibres with the cell bodies of the neurones which give rise to the post-ganglionic fibres in the ganglia.

Epinephrin and *pituitrin* stimulate the sympathetic fibres. For test use 1 c.c. of 1 in 1000 solution of the former, which equals 1-67th grain.

Cocaine stimulates the peripheral endings of the sympathetic system giving a result like atropine but from a different cause. Unlike atropine, a cocainized pupil reacts to light and accommodation. If therefore there is paralysis of the sympathetic endings the use of cocaine in the eye will not produce any mydriatic effect. The use of cocaine renders the whole sympathetic system hypersensitive to epinephrin. In adhesions of the iris the combination of adrenalin and cocaine is therefore very useful.

There is no known drug which paralyzes all the sympathetic fibres.

Ergotoxine paralyzes the favouring sympathetic fibres but not the inhibiting sympathetic fibres.

A table showing the action of these various drugs is readily made by taking the table of symptoms and signs and noting that atropine paralyzes, pilocarpin stimulates the autonomic fibres while epinephrin and cocaine stimulate the sympathetic fibres. Ergotoxine paralyzes the muscle of Müller and the arrectores pilorum of the face, inhibits the heart muscle and dilates the intestinal blood vessels.

Practical uses. The practical applications of the study as mentioned by others, or which I have found helpful in my own work during the past couple of years, are:

1. The stimulation to observation of signs and symptoms in detail, the recording of same, the thought given to their grouping and its application to this classification, not only educates the physician, but gives him a truer summing up and understanding of the individuality of the patient, the lack of consideration of which accounts for many failures in treatment.

2. An aid to the diagnosis of general conditions, and of organs at fault, one marked symptom leading to the discovery of many.

3. The chance of throwing more light on the etiology of some obscure conditions. For example the explanation of the obscure vascular phenomena under the head of so-called vascular crises or angiospasms likely lies in an upset balance between these two nervous systems which control it in accordance with functional needs (Eppinger and Falta). Hirschfelder has shown that there may be an over or under action of one or both systems simultaneously. Raynaud's disease for example being due to a spasmodic constriction of the arterial walls. Erythromelalgia could be produced by a constriction of the vessel walls in one part and a dilatation of the vessels peripheral to that, simultaneously.

Recurrent temporary blindness is usually due to spasm of the retinal vessels. This has been actually observed by eye men several times.

Among other conditions of which I have had examples are *hemiparesis* and *aphasia* (e. g., case of pregnancy in Cedar Cove and Lewis in V. G. H.); migraine; angina abdominis; and

Fainting fits—which according to Pal are hypotensive crises produced in suddenly assuming the erect position. There is a sudden lowering of the blood pressure.

Intermittent claudication is due to spasm of the deep vessels.

Acute angio-neurotic œdema (Quincke's disease) is a vasoneurosis.

Urticaria a vaso-neurosis with toxic origin.

Dermographism is commonest in neuropathic people and in exophthalmic goitre where there is a hypersympathetic tonus.

The paroxysmal unconsciousness of epilepsy is apparently associated with sudden cerebral anæmia. Is it due to a vaso-motor spasm of the cortical vessels?

In many abdominal conditions the sympathetic or its great prevertebral ganglia produce striking clinical phenomena, e.g., acute dilatation of the stomach; and in acute peritonitis—giving intestinal paralysis, meteorism, small pulse and general collapse.

Irritation of the solar plexus in lead colic causes pain and constipation.

The visceral crises in tabes—gastric, intestinal and renal, are due to irritative changes in the abdominal sympathetic.

Mathieu claims that muco-membranous colitis is due to a disorder of the solar plexus; and orthostatic albuminuria, diabetes insipidus and certain forms of glycosuria may perhaps be attributed to solar or splanchic disease. (Recent article in *Archives Intl. Med.*)

Paroxysmal localized hyperidrosis in the distribution of certain nerves occurs e.g., on chewing highly flavoured articles, such as pickles, onions or strong vinegar. This is due to a hyperexcitability of the reflex sweating centre in the pons. It is met in vagatonic individuals. I myself on taking strong vinegar at times have an intense tingling in the skin of the scalp in the part supplied by the great auricular nerve. This seems to be caused by excessive stimuli passing over the chorda tympani and meeting fibres of the great auricular on joining the seventh nerve—it is too rapid for a reflex and is comparable to a similar activity of the lacrymal glands.

4. Relief of symptoms due to the over or under action of either system, by drugging, knowing the drugs which have specific actions on one or other group.

Example. The use of nitrites to relax spasm in the broad group noted of angiospasms and vascular crises, a prompt result being also a therapeutic test and aid to diagnosis. In asthma, where there is a vagotonic constriction of the bronchial muscles, a relaxation is secured by stimulating the sympathetic with epinephrin and further aided by paralyzing the autonomic with atropine.

In certain varieties of angina pectoris the same treatment should apply where there is a similar condition present.

In cardiospasm, pylorospasm, enterospasm and spasmodic constriction of the colon due to a hypertonus of the autonomic system, atropine by paralyzing the nerve endings of the autonomic system relieves the spasm.

In constipation from overaction of autonomic fibres we have spastic muscular action of the intestines. The use of atropine here will inhibit the autonomic action and relieve the constipation.

In this condition adrenalin by stimulating the sympathetic would counterbalance the overacting autonomic and help relieve the constipation.

Pilocarpine by stimulating the autonomic further, would make it worse.

In constipation from overaction of the sympathetic causing muscular inhibition the use of adrenalin would make it worse. Atropine also, by inhibiting the autonomic fibres would add to the trouble.

There is no specific poison for the sympathetic but by stimulating the autonomic with pilocarpine one would help to restore the balance.

As an example I might cite the case of a lady with lumbago and constipation who had not missed taking senna leaves a single night for six years. An examination showed that she had vagotonus and likely suffered from spastic constipation—the lumbago being considered a referred pain. She was atropine tolerant and intolerant of pilocarpine, and tincture belladonna relieved the constipation and incidentally the lumbago completely.

5. To avoid certain errors in drugging. The possibility of anticipating intolerance or idiosyncrasy in certain individuals towards certain drugs—for example, those who will not tolerate atropine, pilocarpine, epinephrin or pituitrin.

6. In surgery to anticipate and avoid shock, for sympathicotonikers, if we might so call them, theoretically should be more likely to suffer severely from shock after an operation. It is here, I think, that Crile has met with much success in his so-called anoci-

association and the steps which he has taken to avoid post-operative shock. By beforehand knowledge that certain patients are hypervagotonic or hypersympathicotonic perhaps some of the failures of this plan of treatment might be avoided. For example in a patient with a vagotonic constitution, operated on for me by Dr. Riggs, Crile's treatment did not produce the desired effect. In another case recently operated on by Dr. R. E. McKechnie, the patient was a vagotoniker and had no shock or bowel paresis though it was quite a severe operation.

7. This is a useful study in considering the dyscrasiæ of the internal glandular secretions. The ductless glands have a considerable controlling influence over the sympathetic. How much is due to the interference of the higher centers is not known, but their action is seen in the vaso-dilatation of blushing, in fear by vaso-constriction, goose-skin and pupil dilatation and the cold sweat of terror. That the cerebrum acts partly through the adrenals is certain. It has been shown that the suprarenal activity through the sympathetic causes every rise of blood pressure by supplying to the circulation epinephrin from the medulla which acts on the myoneural and adrenoneural of the whole sympathetic system. Cannon showed in animals that there is an increased secretion of epinephrin in fright, anger, asphyxia and strong stimulation of the sensory nerves. The adrenal cells and the sympathetic nerves belong to a common system whose first duty is to sustain the activity of the circulatory muscles.

The cortex of the adrenals on the other hand supplies choline which has an action similar to pilocarpine and therefore stimulates the autonomic system.

An extract of the whole gland therefore contains antagonistic substances in their action on the sympathetic systems.

Pemberton and Sweet have shown that secretion from the duodenal endothelium stimulates the flow of pancreatic juice, which in turn is checked by epinephrin and pituitrin so that the sympathetic system plays a rôle in carbohydrate tolerance and glycosuria.

Iodothyrin from the thyroid gland has a stimulating effect on the cervical and thoracic sympathetic and in excess causes the symptoms of Graves' disease.

In status lymphaticus and in Addison's disease the autonomic system is acting in excess—the latter for an obvious reason.

8. This study is an aid in seeking a secondary or primary cause for abnormal functioning

Naturally one of an enquiring turn of mind casts about for a cause or explanation for any improper functioning of such an interesting system of balances, and here as elsewhere it can lead to no harm and perhaps may be helpful to theorize, provided one remembers the point of divergence from the known paths into the unbroken forest.

One cannot deny that there may possibly sometimes be hereditary influences.

Is it microbic? Time will tell. Many cases that are worked out certainly are cured after the correction of some fault in which parasitic life was a factor either in one or more of the viscera or at some distant focus.

The important part taken by the internal glands has been referred to.

The electrical phenomena may provide a helpful study, for it is known that the basic salts are in solution in the tissues broken up into atoms or ions which are either positive or negative electrically.

Then, too, attention has been called to the importance of the calcium, sodium and magnesium ions in the myoneural or adrenoneural—the substance intervening between the nerve ending and the muscle or gland.

This also suggests the possibility of leading to an explanation of the important rôle that calcium and sodium therapy often play. Then Fischer's theories as to the importance of acid formation in the katabolism of all body cells and of alkali in their anabolism may have some further light shed upon them by the study of the vagotonic and sympathetic nerve systems in their control over tissue metabolism, and the profound alterations which may ensue by an upsetting of the normal balance. Certainly to me, in clinical studies there are many things to hint that a kernel of truth may lie hidden in the acid and alkali theory bound up as it is with the anions and kations of the salts in the blood; and these often being secondary to mechanical functional or organic conditions removable under proper treatment. Now that the acid balance can be nicely controlled by the recent work done showing how each article of diet effects it—we have a simple means of righting many vagaries of health which formerly put all our efforts to naught.

Summary and conclusions. Recent work has shed much light on the sympathetic nervous system, but much remains to be done.

It is well to keep in mind the evolution of the various parts of the nervous system, showing in the sympathetic its widespread two-fold character—a system of opposing balances nicely adjusted, with physiological overactions, but showing a great variety of pathological conditions, in which one or other system gains the upper hand. The autonomic or vagotonic, and the sympathetic proper are the names used most frequently for the two sets. The action of each system on each part of the body has been set forth in tables of symptoms and of reflexes. The occurrence of two sets of patients with constitutions showing excess of vagotonia or sympathicotonia is outlined—the former with symptoms of overaction of the autonomic system, hypersensitiveness to pilocarpine and tolerance for epinephrin—the sympathicotonic patient giving symptoms of overaction of the sympathetic, hypersensitiveness to epinephrin and tolerance for pilocarpine and atropine.

Electrical stimulation of the different sets produces the symptoms as per table.

The action of drugs having specific action on either system has been noted, showing that atropine paralyzes the nerve endings of the autonomic, pilocarpine stimulating it; epinephrin stimulating the sympathetic, and ergotoxine paralyzing a part thereof.

The conclusions are that this study is useful:

1. To stimulate observation and understanding of the constitution of one's patient.

2. As an aid to diagnosis of general and local disease by observation.

3. By therapeutic drug tests.

4. By throwing light on the etiology of many obscure phenomena including the vascular crises and certain abdominal abnormalities.

5. In the treatment of symptoms due to over or under action of either system.

6. In avoiding serious or unpleasant results in idiosyncrasies to certain drugs.

7. As an aid to the surgeon in avoiding shock after operation and any special danger from inhalation pneumonia.

8. Showing the intimate connexion of the ductless glands with the sympathetic system and their combined important influence in body metabolism, through hormones and the basal salts.

9. In encouraging speculation as to the causes direct and remote in patients, with the possibility of correcting errors both surgically and medically.

TISSUE RESPIRATION IN THE LIGHT OF RECENT RESEARCH

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IT has been known for a long time that living tissues possess both reducing and oxidising powers. In 1883 Hoppe-Seyler drew attention to the strong reducing processes in living tissues; and Professor Theobald Smith has recently used liver-juice as the agent with which to close the open end of a tube where bacteria could best grow under anærobic conditions. Ever since the time of Lavoisier it has been certainly known that the carbon dioxide and water eliminated from the animal body have been produced by the oxidation of carbon and hydrogen within it. It was originally held that this "carbonaceous" oxidation took place in the blood itself, but the undoubted production of carbon dioxide by a frog whose blood had been replaced with salt solution showed that at least that gas must have originated in the tissues and not in the blood. Oxidation and reduction evidently go on side by side within the living tissues; oxygen they must have, and they soon die if it is withheld. The source of this oxygen is of course the respiratory pigment oxyhæmoglobin, whose loosely held oxygen is removed by the tissues which are, therefore, said to have oxygen-avidity (*Sauerstoff-Bedürfniss*) or reducing power. This continual oxidation of materials within the tissues and the reduction of the oxyhæmoglobin in the circumambient blood is conveniently called tissue-respiration. Within the last few years, attempts have been made to gain a clearer insight into both the processes of tissue oxidation and tissue reduction, with the result that both are now thought of as carried out by intracellular ferments. Many workers on the continent of Europe and in England have studied the action of what have been called oxidases, ferments believed to be concerned in effecting oxidations of a large number of substances inside the living cells. These workers have studied the expiratory phase of tissue-res-

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piration, the exact nature of the oxidative process leading to the final formation of carbon dioxide and water with the production of correlated intermediate substances.

Those who work on oxidases are continually meeting with evidences of substances in the living tissues which appear to be working in the direction opposite to that of oxidation. One particular oxidase has the power of oxidising indo-phenol-white to indo-phenol-blue, and has been studied by Vernon who calls it "indo-phenol-oxidase." Studying the quantitative estimation of this oxidase, Vernon encountered "the unavoidable presence of reducing substances some of which are possibly enzymes or reductases which act in direct antagonism to the oxidases, and under certain conditions entirely overpower them. Hence the absence of an oxidising action cannot be held to indicate the absence of oxidase unless the conditions are so chosen to give the oxidase the best possible chance of exerting its activity." Now it is just these reducing agents which, on the other hand, I have been studying for some years past. In 1885 Paul Ehrlich published an elaborate research into the reducing power of living organs whereby they were able to reduce indo-phenol-blue to the leuco-compound and alizarine blue to alizarine white. The pigments were injected subcutaneously into living animals. Ehrlich found that almost all organs examined reduced one or other of these pigments, some organs with great energy, such as liver, fat and the gastric mucous membrane. He recognized that, even when he could not detect reduced pigment, it did not prove that there had been no reduction, but only that oxidation had been quantitatively greater. The title of Ehrlich's paper was "The oxygen-avidity of the organism," for he recognized that it was in virtue of the avidity for oxygen on the part of the tissues that they were also able to reduce certain pigments to the colourless or chromogenic condition. In other words, the oxygen avidity is one expression of reducing power. Ehrlich made no suggestion that this power was due to a ferment.

In 1896 I noticed that when an animal, still alive though chloroformed, had been injected with the mixture of gelatine and soluble Prussian blue so much used by histologists for demonstrating microscopic blood-vessels, and had been cut up immediately, that such an organ as the liver, instead of being blue, was colourless. On cutting up the liver and exposing the portions to the air, the blue colour was observed to be restored until one could see minute vessels which a moment before were quite invisible. The restoration of blue colour was very rapidly brought about by pouring hydrogen peroxide over the colourless surfaces. The bleaching of the soluble Prussian blue in the gelatine injection mass was attributed to *reduction* of the blue potassium ferri-ferrocyanide to the colourless di-potassium ferro-ferrocyanide; in terms of physical chemistry to the removal of a positive ionic charge of electricity from the tri-valent ferric-ion. Similar results were obtained on injecting the vascular system of the surviving kidney. It then occurred to me that if the kidney could reduce a pigment which was still in its vessels, the organ, if injected under sufficient pressure, might be constrained to excrete an artificial urine through the normal channel of the ureter. I found it possible to effect this. On injecting into the artery of a sheep's kidney the warm soluble Prussian blue and gelatine mixture, I obtained from the cannulated ureter a few drops of an absolutely colourless substance—an artificial urine—which on being treated with hydrogen peroxide at once became blue. The kidney had, then, excreted some gelatine and reduced soluble Prussian blue, proving that these substances had travelled from the blood capillaries to the ureter and in the passage had been reduced by the still living renal epithelium. But after a time it was noticed that the outflow from the ureter had become blue, the kidney cells had become poisoned and so no longer able to carry on their vital reduction. It is not to be supposed that the living tissues can withstand for more than a certain time treatment with substances which cannot be other than ultimately toxic for them. In later experiments ferric chloride was used with both the liver and kidney in order to determine whether a substance devoid of oxygen could be reduced to the lower form—ferrous chloride—on being perfused through surviving organs. From the kidney was obtained an artificial urine which contained ferrous chloride, and some ferrous chloride was present in the liquid which emerged from the renal vein. Similar results were got with the liver; from its bile duct ferrous chloride was drawn off (artificial bile) and in the fluid from the hepatic vein some ferrous chloride was present.

The activities of tissues may be studied in other ways than by injecting chemical substances into their vessels; for instance the organs may be crushed in a juice-press until thoroughly disintegrated, and the resulting juice mixed with some pigment or other substance the reduction of which is expected. By this means the active reducing material is brought into a contact with the reducible material which is very much more intimate than when, for instance, masses of the organ are merely immersed in the reducible solutions. By this technique, press-juice of liver and kidney of cat, sheep, rabbit, horse and frog was able to reduce methylene blue to methylene white, sodium indigo-disulphonate to the colourless chromogen and sodium nitrate to sodium nitrite. It was found also that e.g., liver juice could reduce the pigment methæmoglobin first to the stage of oxyhæmoglobin and later to that of fully reduced hæmoglobin. A boiled control of these juices had no reducing power whatever.

Two French workers, Abelous and Gerard, as long ago as 1899 had suggested that these reducing powers of tissues might be due to the presence of a ferment to which they gave the rather barbarous name "reductase." Later reasons will be given for suggesting a more specific term for this tissue-ferment.

My work carried out in 1909-10 was undertaken with a view to determine what was the evidence for the existence of a reducing enzyme in tissue press-juice. The results then obtained, taken in conjunction with others arrived at more recently, have gone far to convince me that there is a tissue-ferment with reducing powers. We have no evidence that this ferment differs qualitatively whether it is derived from liver, kidney or other tissue.

Some of the evidence for this conclusion may be summarized as follows:

In the first place in a control experiment where the juice is boiled, none of the reducible substances mentioned above is reduced thereby. The temperature of boiling water, as is well known, destroys the activity of all enzymes.

In the next place, the general behaviour of the juice according as the temperature is raised or lowered is in agreement with the behaviour of acknowledged enzymes. Thus at minus 10°C., there is no reduction of soluble Prussian blue by fresh liver juice, and it is extremely slow at zero; inhibition may be induced indefinitely by keeping the mixture of pigment and juice surrounded by a freezing mixture; on the mixture being removed to air temperature, reduction goes on as rapidly as is usual for that temperature; the ferment, therefore, has been inhibited but not destroyed. As the temperature rises, the velocity of reduction increases correspondingly; the optimum temperature is somewhere between 40 and 45°C. Like recognized enzymes, reductase has a destruction-temperature which is in the neighbourhood of 70°C.

While fresh juice reduces soluble Prussian blue within a minute or so at room temperature (17°C.), its activity rapidly falls off, so that after twenty-four hours it takes some minutes longer to bleach the pigment; yet juice which takes some minutes at room temperature has its time distinctly shortened at 40°C., the blood heat. There is a decay in the activity of tissue reductase the longer the juice is kept even when it has been covered with a layer of toluene to prevent putrefaction. In a particular series of recent observations extending over a week, the following fall off in activity of reduction of liver juice was estimated.—At the end of twenty-four hours the activity had fallen to 80 per cent. of its original value, at the end of the second day to 66 per cent., at the end of the fourth day to 30 per cent., and at the end of the eighth day to about 5 per cent. The survival of hepatic reductase to the eighth day is evidently not an isolated phenomenon, for quite recently it has been found that both hepatic xanthinase and uricase are active in liver juice as late as the fifth day. We shall later see that this decrease in activity is amenable to mathematical treatment.

Since several substances are known to be able to bleach soluble Prussian blue or cause it to fade, one had to eliminate the action of such as could possibly vitiate the results. Alkalies had first to be disposed of. It is of course true that alkalies can cause rapid fading of soluble Prussian blue and certain other pigments, but none of these is present in the living tissues. When all the various inorganic salts present in the blood or lymph had been examined, it was found that none of them caused any fading of the blue beyond what a similar dilution with water would have done. No more effective were mixtures of the salts; and Ringer's solution itself produced no fading. Reductase certainly acts like a reducer in an alkaline medium. Acid, therefore, added to the soluble Prussian blue and gelatine mixture prevents that complete reduction in the capillaries of an injected organ which occurs in its absence. Histologists recommend acetic acid being added to this particular injection mixture in order to prevent "fading by the alkaline tissues." That the inorganic salts of the blood do not reduce soluble Prussian blue is shown by the fact that when the blue and the red (of the blood) meet in the large vessels they form purple in those cases where the blood is not washed out previous to injection; but if the blue were reduced to the colourless state, the blood would be red in the large vessels, whereas it is always purple when the one pigment does not predominate over the other. It is hardly necessary to say that reduction was not due to products of putrefaction, for not only were the juices kept under toluene, but the reducing power falls off with age while the products of putrefaction must necessarily accumulate as time goes on. The next factor which had to be eliminated was the supposed reducing power of proteins (colloids): this was taken up by a co-worker of mine, Dr. H. J. M. Creighton.* Briefly stated his conclusions were: colloids such as gelatine and egg-white reduce soluble Prussian blue with great rapidity at 100°C, in about half an hour at 60°C, while the reduction is barely perceptible at room temperature at the end of many hours. It was shown that the protein formed a colourless compound with the pigment, and that reduction was due to the removal of a positive ionic charge. Seeing, then, that fresh liver or kidney juice at room temperature can reduce soluble Prussian blue to the leuco condition within sixty seconds, the agent operative in the case of colloidal reduction is not that which we have been investigating in tissue-juices.

We think it is possible that these colloidal phenomena worked out by Creighton are the reductions which Heffter has studied. Heffter holds that the so-called reductase reductions are not vital (enzymic) but are all due to the interaction of colloids and pigments. He says that crystallized egg-albumen can effect reduction. The blood-proteins certainly cannot do so either at room temperature or at 40°C.

Now, however interesting and important the study of the action of reductase on various pigments and other salts capable of reduction may be, we have to remember that none of them is even approximately the natural medium of the tissues and most of them are distinctly toxic for the living substance. Nothing other than oxyhæmoglobin is the natural substance yielding the oxygen dealt with by tissue reductase. Dr. Creighton and I have recently, therefore, made a systematic investigation into the relationships of reductase and oxyhæmoglobin in solution, a research which has brought to light many fresh data. The method used was spectroscopic: that is, the change from the two-banded spectrum of oxyhæmoglobin to the one-banded spectrum of fully reduced hæmoglobin was followed with a direct-vision spectroscope. There are two advantages in this method; the first that the reductase was acting, as it were, in its own proper substrate, the respiratory pigment oxyhæmoglobin, the second that the end-point was as accurate as could be obtained in a spectroscopic method. The personal factor was practically eliminated. As the mixture of juice and diluted blood was examined from moment to moment, the two bands were seen gradually to fade away and be replaced by the single fainter band of the reduced pigment. The change of colour seen by the naked eye was observed to correspond very closely with the spectroscopic appearances. The fresh mixture of tissue-juice and oxyhæmoglobin was of course pink, but as reduction proceeded it became of a duller red, until finally when fully reduced it was of the purple or livid colour so characteristic of venous blood. Towards the end of our work we were able to say, even by inspection, when a specimen was fully reduced: the spectroscope almost always corroborated us. We found that the fresh liver juice (cat) in presence of an aqueous solution of oxyhæmoglobin (cat's blood diluted one in twenty-five) would completely reduce the pigment at 40°C. within five to six minutes. At room temperature (17-20°C.) the time was approximately four times as long. The acceleration in the rate of the reduction of blood pigment with rise of temperature was particularly instructive with fresh juice; the times of reduction were 36 minutes at 10°, 22 minutes at 20°, 10 minutes at 30°, 5 minutes at 40°, 2·5 minutes at 50°, and 1·75 minutes at 55°C.

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* Creighton, H. J. M., Nova Scotian Inst. Sci., 13, (2), p. 61, (1911-12).

Since reductase thus can work through a large range of temperatures, we might expect that it would be found both in cold-blooded and in warm-blooded animals. This we discovered to be the case, for we had unmistakable evidences of its activity in tissue-juices both from the frog and from the fish. At room temperature, a specimen of liver juice from the fish which reduced oxyhæmoglobin in 7 minutes, reduced it at 40°C. in 2 minutes. We found reductase in fact in four out of the five great groups of the Vertebrata: mammals, birds, amphibia and fishes. The reductase from fish's liver was amongst the most energetic of any we encountered: the reason seems clear; the fish has access to so little oxygen that its organs must be able to extract it very thoroughly.

The marked acceleration of reduction at temperatures above 40°C. is in accordance with what we know as to the intensification of respiratory tissue changes in fever. Herter has told us that in hog cholera the reduction processes are exaggerated.

We had no evidence that reductase was qualitatively different in the various organs of the same animal nor in the different kinds of animals examined. There is no specificity of reductase from any one source in reference to hæmoglobin from any other. Thus the cat's liver juice can reduce the blood of any other mammal or of a bird, a frog, or a fish. The reductase of a bird can reduce the blood of a mammal, a frog, or a fish and so on We have called these "crossed reductions;" they prove there is no mutual specificity of relationship between the enzyme and the pigment. Incidentally they corroborate the belief that the resemblances between the hæmoglobins from various animals are more numerous than the differences. The physiological significance of the absence of any specificity between reductase and hæmoglobin is that foreign blood introduced into any animal can still be reduced by that animal so that, for instance, human tissues can obtain oxygen from the hæmoglobin of any lower animal. The danger to the human being as regards blood-transfusion is not that the foreign blood will not be reduced, but that it may act hæmolytically toward the red corpuscles of the receiver.

The object of the tissue reduction of oxyhæmoglobin is virtually to cause the oxygen to dissociate from the pigment; all work therefore on the subject of the dissociation of oxyhæmoglobin has a bearing on the present problem. Some workers have laid stress on rise of temperature as a factor in this dissociation. Where this factor is operative, it is a vastly slower action than that of reductase. After many hours a tube of oxyhæmoglobin kept at 40°C. is still unreduced, whereas, as we have seen, certain juices at room temperature will reduce twice or more of their volume of diluted blood in two to three minutes. Temperatures above body-temperature (40°C.) do not enter into the problem in healthy animals. Since oxyhæmoglobin can be slowly reduced at 10°C. and even at 0°C., we hold that reductase is the factor operative at low temperatures in the cold-blooded animals. The almost complete cessation of reduction at 0°C. and below is an interesting demonstration in vitro of the artificial counterpart of that cessation of tissue respiration which constitutes the condition known as "latent life."

In the next place the presence of carbon dioxide in the blood has been proved by Barcroft to be a factor in facilitating the dissociation of oxyhæmoglobin in vitro. This is regarded as a most important factor in the case of cold-blooded animals. Important as this has been shown to be in laboratory experiments, we are fully convinced that it is not the chief factor in the reduction of oxyhæmoglobin even in the poikilothermic animals. The factor responsible for the reduction of oxyhæmoglobin is highly insoluble; but carbon dioxide is very soluble. Similarly, traces of acid have in laboratory experiments been demonstrated to facilitate the separation of oxygen from oxyhæmoglobin. We do not think that this either is a factor of high importance in tissue reduction. Since it is true that juice kept aseptic developes acidity in autolysis, the older the juice the more vigorously it ought to reduce if acid were an important factor, but we have shown that the exact opposite is the case. Traces of acid tend to form methæmoglobin, a pigment we have never noticed in any mixture of active tissue-juice and oxyhæmoglobin. Again the acids in question—for instance lactic—are soluble, the reducing agent in press-juice is comparatively insoluble. It might be noted that in dealing with liver juice and oxyhæmoglobin, we have eliminated both bile and dextrose as factors in the reduction of the pigment. It may be remarked that the so-called reducing power of colloids is exerted only against certain pigmentary substances and not at all against oxyhæmoglobin. In other words, the "Creighton effects" have no analogies in connexion with the reduction of oxyhæmoglobin; for one thing, it is impossible to heat blood to 100°C. without its being decomposed.

If the substance responsible for reduction in tissue-juices is an enzyme, it ought to be injuriously affected by contact with poisons, substances known to destroy or retard the action of catalysts in general. A considerable number of such substances were examined by allowing fresh liver juice (cat) to remain in contact with solutions of the poison for ten minutes, and then comparing the time required by the poisoned juice to reduce oxyhæmoglobin with that required by the same quantity of unpoisoned juice. Two strengths of poison were employed; 0·1 molar and 0·01 molar, a strong and a weak respectively. All the following were investigated: formaldehyde, mercuric chloride, potassium cyanide, gold chloride, osmic acid, manganous chloride, ammonium bromide, arsenious acid, ammonium chloride and sodium arsenite. Unfortunately, certain toxic substances could not be used at all on account of the way in which they caused the blood solution to fade when added to it; among such were acids, copper sulphate, etc. In a particular series of experiments, ten minutes was the time found to be necessary for the complete reduction of oxyhæmoglobin by unpoisoned juice, whereas the times for poisoned juice were with the weaker solutions as follow: arsenious acid 33′, potassium cyanide 30′, mercuric chloride and sodium arsenite 17′, gold chloride 15′, osmic acid 13′ and formaldehyde 10′. When the stronger solutions were employed, the times were lengthened, for instance, for formaldehyde 48′, potassium cyanide 34′, manganous chloride 25′ and osmic acid 19′. Ammonium chloride alone of all the substances tried had no poisonous effect at either concentration; this is in accordance with what we know of it therapeutically.

One substance highly poisonous to animals, carbon monoxide, is of particular interest spectroscopically. It is a poison, because it unites so firmly with hæmoglobin that it prevents the formation in the lungs of the much less firm combination, oxygen and hæmoglobin. The pigment therefore carries carbon monoxide instead of oxygen to the tissues which are, in consequence, starved of oxygen or asphyxiated. The affinity of carbon monoxide for hæmoglobin is stronger than that of carbon monoxide for the tissues. Translated into terms of our conception, the tissues cannot split off the carbon monoxide from the hæmoglobin because reductase being an oxygen carrier and oxygen activator has no affinity for carbon monoxide. It was, therefore, very interesting to determine whether the carbon-monoxide-hæmoglobin, a pigment with a well-known spectrum, would remain unaltered in the presence of reductase or whether it would be in any way changed. It remained unaltered for many hours at 40°C., showing that reductase in its state of comparative freedom in tissue-juice was as powerless to break up the carbon-monoxide-hæmoglobin union as it is in intact cells.

Recently we have studied the enzymic nature of the active agent of tissue-juice from the kinetic standpoint. Measurements were made to determine the value of the temperature coefficient of the activity of reductase, and also to determine the nature of the law governing the decay in the activity of the enzyme. As regards the former, we obtained the necessary data from experiments on the reduction of oxyhæmoglobin by cat's liver juice at different temperatures. To determine the temperature coefficient, the time required to reduce oxyhæmoglobin at any one temperature was divided by the time required to reduce it at a temperature 10° higher. Between 10° and 40°C. the velocity of reduction is approximately doubled for each 10° rise in temperature, so that the temperature coefficient is about two. This discovery as to the behaviour of tissue-juice with rise of temperature, confirms our general contention that we are dealing with an enzyme. Above 40° it has been found that the increase in the velocity of reduction with rise in temperature rapidly falls off. Between 50° and 60°C., the temperature coefficient has been found to be 1·43. Although usually the temperature coefficients of reactions decrease slightly with increase of temperature, the decrease in the values obtained for the reduction of oxyhæmoglobin by reductase at temperatures above 40°C. is much greater than would be the case in ordinary chemical reactions. Since it is exceedingly probable that the optimum temperature of reductase lies between 40° and 46°C., the acceleration of the velocity of reduction due to increase in temperature is evidently to a certain extent counteracted by a partial inhibition or destruction of the enzyme, the result being a decrease in the value of the temperature coefficient.

Mathematical treatment of our data shows that if the decrease in activity of the enzyme be regarded as proportional to the decrease in its reducing power, then the expression

$$\frac{1}{0.4343t}.\log\left(\frac{a}{a-x}\right)=k$$

is found to hold. Considering the sources of error in our experiments, the values obtained for k are sufficiently constant to warrant our assuming that the decay in the activity of reductase follows the monomolecular or logarithmic law. In the foregoing equation a represents the initial activity (100 per cent.) of the enzyme and x the percentage decrease in activity at the end of time t. Determinations of the reducing power of cat's liver juice of different ages, carried out at 55°, 50°, and 40°C., gave the following respective mean values for k, 0·0132, 0·0134 and 0·0121.

We are now perhaps in a position to summarize the evidence which has been accumulating to indicate that in living tissues there is a ferment for internal respiration capable of effecting chemical reduction.

1. The criterion of solubility naturally occurs to one first of all. Reductase is certainly not soluble if by "soluble" we mean capable of entering into pure water. We have, however, found that with difficulty some of it can pass from liver juice into 0·75 per cent. NaCl and from disintegrated muscle into glycerine and saline solution, which mixture seems better than either menstruum alone. Reductase is not soluble in the sense that pepsin is soluble; it leaves its association with the cell proteins with great difficulty, nor will it dialyse away from them. The glycerine and saline extract (muscle) or "solution" did, however, reduce oxyhæmoglobin in two to three minutes, while the boiled control had no effect whatever. Neither reagent by itself has any reducing effect. This glycerine and saline muscle extract also reduced soluble Prussian blue.

All subsequent attempts to isolate the ferment have failed. Indeed, it was through finding the injurious influence of alcohol and ammonium sulphate on the ferment used with the view of precipitating it, that we were led to study the poisonous effects of other materials. The comparative insolubility of reductase is perfectly intelligible. The rôle of the ferment is to obtain activated oxygen at the boundary of the cell; it would not serve the interests of internal respiration for reductase to be able to leave the cell and circulate in the blood. It is not a secretion like the exoenzymes pepsin, ptyalin, etc.; it is an endo-enzyme as is glycogenase, but, unlike glycogenase, it is insoluble, and as such by no means alone in that class.

2. The next criterion that may be applied is the manner in which the activity of an enzyme varies with fluctuation of the temperature. The behaviour of reductase is wholly in accordance with that of undoubted enzymes; there is inhibition but not destruction below and at 0°C., as the temperature rises there is greater and greater velocity of action until the destructive effects of heat begin to make themselves felt. That is to say, there is an optimum and there is a destruction temperature

3. The temperature coefficient of, approximately, two between 10° and 40°C. is in line with known enzymic action.

4. This is also true of the logarithmic nature of the decay in the activity of the enzyme.

5. The deterioration with age of reductase in a moist medium also conforms to the behaviour of other enzymes. It withstands complete dessication badly.

6. The fact that poisons for catalysts similarly affect the actively reducing substance in press-juice, is in favour of that substance also being an enzyme.

7. The criterion of reversibility is one which is difficult to to apply to reductase. Stated baldly, the ferment does not induce any reversed action in the direction of oxidation. Press-juices reduce materials once for all, and no oxidation in virtue of the presence of reducing agents is possible. Oxyhæmoglobin once reduced is not re-oxidised. But since oxidases are always present acting simultaneously with reductases, the chemical complex oxidase-reductase is functionally equivalent to a reversible ferment. In this connexion, one should remember that the Cannizzaro reaction—simultaneous oxidation and reduction—has actually been obtained when certain aldehydes were digested with liver tissue, thus

$$2R{\cdot}CHO + H_2O = R{\cdot}CH_2{\cdot}OH + R{\cdot}CO{\cdot}OH$$

where one molecule of the aldehyde is oxidised to the acid and the other reduced to the alcohol. Parnas has actually suggested the term "aldehydemutase" for the hypothetical enzyme concerned.

The object of tissue respiration as distinct from tissue nutrition may be said to be two-fold; to produce heat and to prepare katabolites for excretion. Thus carbohydrates are oxidised to yield carbon dioxide and water as end-products, although exactly how is not even yet throughly understood. As aldehydes (aldoses) the carbohydrate chains are capable of disintegrative oxidation; and already aldehydases have been assumed.

The fatty acids are certainly oxidised in the tissues after being desaturated in the liver. The long carbon chains are broken up at the β-carbon atom on each oxidation until finally β-hydroxybutyric acid is obtained which is ultimately oxidised in the presence of sufficient carbohydrate to carbon dioxide and water. If insufficient carbohydrate be present, then the acetone group of bodies is excreted which is the chemical abnormality in diabetes.

Amino-acids are certainly oxidised after deamination which is itself regarded as enzymic. Amino-acids thus deaminated are ordinary fatty acids which can then undergo the progressive oxidative break-down to which these acids are liable. Lastly, bodies of the purin group undergo oxidations within the tissues, and specific enzymes are described which accomplish these.

These various oxidations in the tissues which are now regarded as enzymic are thermogenetic and are entitled to be considered as making up internal respiration on its dis-assimilatory side. We may in fact, speak of tissue-expiration, since the various processes have for their object the excretion of waste-products. The concensus of chemical opinion, then, is that tissue-*ex*piration is dominated by intracellular ferments, and all that we claim at present is that tissue-*in*spiration should be so regarded. We have evidence of a very powerful intracellular ferment which brings active oxygen within the sphere of the oxidases. This is the ferment already called reductase in 1899. I think that the time has come to give it its specific name of *hœmoglobinase*, for hæmoglobin is the source of the oxygen it deals with, hæmoglobin is the substance reduced by it, hæmoglobin is its natural substrate or substance on which it normally acts.

A comparatively recent observation by Dakin* is of interest in this connexion. "The oxidation of β-hydroxybutyric acid to aceto-acetic acid was shown by Dakin and Wakeman to be due to an enzyme which could be roughly separated from liver-tissue. The action of the enzyme was not very vigorous, but was markedly increased by the presence of oxyhæmoglobin. Oxyhæmoglobin alone was entirely without action." It seems exceedingly probable that in separating, admittedly roughly, the oxidising enzyme, a certain quantity of reductase was present along with the oxidase and added hæmoglobin. The reductase would reduce the oxyhæmoglobin activating the oxygen which under the influence of the oxidase oxidised the acid as reported. This explanation at least accounts for the phenomenon observed and especially for the fact that the hæmoglobin *alone* had no influence.

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* Dakin, "Oxidations and reductions in the animal body." Dakin, Longmans, 1912, p. 23.

In his recent text-book of "Physiology," Professor Starling* writes: "There is no doubt that reducing substances are found under normal circumstances in the tissues . . . . and it is possible that such reducing substances may aid in activating oxygen and in the *induction* of certain oxidative processes." The italics are mine, for this precisely expresses my belief that the chief reducing substance in fresh normal tissues is an enzyme which does originate or induce the oxidative tissue activities. This was indeed Hoppe-Seyler's original suggestion; all our work is in the direction of confirming it.

The source of active oxygen, as is well known, has been referred to intracellular peroxides of which an inorganic example is hydrogen peroxide. Now it is remarkable that most tissue-juices contain the enzyme catalase whose duty would seem to be to decompose hydrogen peroxide into water and molecular oxygen thus—

$$2H_2O_2 = 2\ (H_2O) + O_2;$$

but that catalase is not responsible for the reductions we have been studying we have detailed evidence. A peroxidase has been postulated as responsible for the decomposition of hydrogen peroxide which yields the active oxygen thus—

$$H_2O_2 = H_2O + O'.$$

Whatever, then, the peroxidase is, it is virtually a reducing agent. I am not prepared to explain the relationship of reductase to peroxidase or to the hypothetical peroxides, but I prefer to conceive of the inspiratory phase of tissue-respiration as the removal of oxygen from cell lymph and, therefore, ultimately from oxyhæmoglobin by the activity of a reducing endo-enzyme. I find in tissues an enzymic reducer; it reduces hæmoglobin to the completely reduced condition, and since it carries oxygen from it in this way it is, in one sense, an oxygenase. It is quite possible that the organic peroxide plus ferment of certain writers is none other than our hæmoglobinase which is certainly of colloidal nature. There seems no need of retaining the term "oxygenase" when hæmoglobinase is a more specific term for a ferment which can do all that oxygenase is supposed to do and considerably more.

We have seen that reductase is very insoluble: the true meaning of this may be that what we call reductase is in ultimate cellular analysis the totality of certain side-chains of the living protoplasmic molecule (biogen) which possess affinities for oxygen. These, in the nature of things, cannot be disrupted from the biogen without compromising its functional integrity. This sort of thing on ultimate analysis an *endo*-enzyme proves itself to be; and Vernon has indeed remarked on the insolubility of certain oxidases.

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* P. 1236.

It is true that on this view the distinction between "vital protoplasmic activities" and enzymes is obliterated, but it is quite possible that that distinction has been made too absolute. When an exo-enzyme or enzymic secretion (such as ptyalin, pepsin) can perform its function equally well in the cavity of a viscus or in vitro we may be justified in maintaining the distinction between vitality and enzymic action. The secretion enzyme was, however, part of the protoplasmic molecule before its separation. It is not the act of disrupting the side-chain that constitutes an enzyme; doubtless disrupted side-chains are our separable ferments and because disrupted are more or less soluble. But non-separated side-chains can still be called ferments (endo-enzymes) which because undisrupted are "insoluble." The former—the secretion-enzymes—are destined to leave the parent protoplasm, the latter are not intended to be separated from the biogens and are, therefore, called endo-enzymes. It is not whether they act outside or inside the protoplasm that constitutes them ferments, it is their functional powers that confer the title on them. Since animal heat is genetically an intracellular affair, the ferments, therefore, which are concerned in its evolution, hæmoglobinase and the oxidases, are also intracellular. The former is non-specific, the latter highly specific: the former is for obtaining oxygen wherever available: the latter are specialized each for the oxidation of only one kind of substance.

But reductase is not merely a deoxidiser: although in Nature it is concerned only with the reduction of oxyhæmoglobin, yet it is a true reducer; it can reduce substances as stable as soluble Prussian blue; alizarine blue; methylene blue and indigo blue; it can reduce nitrates to nitrites and ferric chloride to ferrous chloride. Let us, therefore, in the light of recent work not hesitate to bring tissue-respiration under the category of fermentation; its oxidative side is now generally admitted to be endo-enzymic, let us complete the conception and regard its reducing aspect as also endo-enzymic.

Case Reports

FOREIGN BODY IN ŒSOPHAGUS

REPORTED BY HARRY H. McNALLY, M.D., C.M.

Fredericton, N.B.

AT Christmas Tide, Harry M., whose age is four years, swallowed a Canadian cent. When called at the time of accident he was feverish and nauseated. I listened with the stethescope, while he swallowed water; there seemed to be no hesitation as it passed from the mouth to the stomach. He was fed as much as it was possible to get him to take, of baked potatoes followed by laxatives, yet a careful watch of stools did not discover the cent; soon after his condition seemed to be quite normal, and as the child's attendants reported the finding of a cent in the room, it was decided that he had not swallowed it. For this reason, when called again after some weeks, to see him, suffering from croup, so called, I did not think of any trouble arising from pressure.

Six months after the accident the child was brought to my office and the following complaint recorded: he is croupy much of the time, but not all of the time; he complains of something hurting him so much that at times he will throw himself across a chair, and at night he must get in a certain position to rest with any comfort; he now cannot get much solid food down.

I noticed that his voice was of a squeaky metallic type. The stethescope did not reveal anything abnormal in the chest. Diagnosing pressure of some kind, an x-ray plate showed a Canadian cent lodged at the junction of the first rib with the sternum.

On May 15th, at Victoria Hospital, Fredericton, while Dr. C. P. Holden gave the anæsthetic, I made an incision close and to the left side of the trachea extending from one inch and a half above to the notch of the manubrium sterni, carefully dissecting down to the œsophagus. Dr. Holden passed a stiff lisle-thread catheter down the œsophagus to guide in opening the tube enough to enable me to put my finger within and feel the cent, which was firmly fixed as if pivoted. No doubt when the position of the cent would change his symptoms would become aggravated. At times the pressure was on the left recurrent laryngeal nerve, thus producing the symptoms of croup and change of voice.

With a pair of artery forceps I followed my finger and extracted the cent. The gullet was stitched with iodized catgut; the deep muscular and fascial tissues were not drawn together, but after placing a rubber drainage tube at the bottom of the cavity leading to the mediastinum the superficial tissue was stitched together.

The child was fed by the rectum with peptonized milk for three days, an intermediate saline being given. On the third day sterilized milk was given by mouth; sterile water was given previous to this. The tube pushed itself out on the second day and was not replaced; the stitches were removed before the end of the first week. Liquid food came through the opening for nine days, then closed completely, and solid food was given and taken with comfort. On the twelfth day the wound was perfectly healed with only a protective dressing over scar.

Patient seems in ordinary health, with voice of the normal type.

FREDERICTON, N.B., June 15th, 1915.

AN UNUSUAL CASE OF A NEEDLE LODGED IN THE DUODENUM

REPORTED BY W. A. LINCOLN, F.R.C.S.

Calgary

PATIENT was that of a young woman of Austrian descent, referred to me by Dr. George McDonald of this city.

About a year ago she met with a street car accident receiving a severe head injury. She remained in bed for several weeks, during which time she had a good deal of irritation and delirium. She was very difficult to control and had a mania for biting and putting things in her mouth, she was several times caught with pins in her mouth but was not known to have swallowed anything. She made a good recovery, but soon after began to complain of a very sharp pain coming on a few minutes after taking food, and felt in the region of the umbilicus or a little above it. The nature of the food made no difference, liquids causing as much pain as solids, but in both cases ceasing at the end of digestion. At times she was nauseated but never vomited. Never observed any blood or tarry material in the stools. Medical treatment was tried but was of no avail. A bismuth meal was administered, and the x-ray revealed a needle in a perpendicular position one inch to the right and the same distance above the umbilicus. Stereoscopic picture shows the needle in front of the spine but fairly deep in the abdomen. Patient was kept under observation and other pictures taken, but the needle, apart from moving a little laterally, did not alter its position. The patient was anxious to have it removed, so an exploration was done. On following the pylorus around to the duodenum the needle could be felt imbedded in the duodenum deeply, behind the transverse colon. At first it was found difficult to move it but at length it was worked up and its point made to perforate above the transverse colon, from where it was easily extracted, the opening being closed with a purse-string suture.

The needle was blackened and eroded and showed evidence of having been present for some time. The patient made a good recovery and has been free from digestive disturbance ever since. Patient states positively that she does not think it possible that she could have swallowed it except when in delirium. The interesting part of the case is the apparent fact that the needle remained in the second part of the duodenum for a year, and also the train of symptoms which its presence caused.

A SUM of money has been given to the Harvard Medical College by Mr. Douglas Flattery, of Boston. The annual income from this money, which will be about $800, is to be devoted to the encouragement of scientific study of the cause, cure, and prevention of disease.

Editorial

TWILIGHT SLEEP: THE DÄMMERSCHLAF OF THE GERMANS

THIS somewhat fanciful title has been employed to designate the condition of semi-narcosis induced in the parturient, by the exhibition of scopolamine and morphia. The use of these drugs in labour has been widely heralded, in the lay press, as a marvellous discovery which makes child-birth painless. As a matter of fact it is not so much a great discovery as a gradual improvement in a method of drug administration, wherein, in the large majority of cases, the labour is not altogether painless.

Scopolamine, or the hydrobromide of hyoscine, was first used in labour by von Steinbuchel in 1902; and it was in 1903 that Gauss, of Freiburg, began his empirical work with this drug. He combined the scopolamine with morphia, and the result was the so-called "Freiburg Method," which was given to the medical profession some four years later. This method has been practised in many clinics, both in Europe and America, during the intervening years, and has experienced varying, and somewhat contradictory, results. It has been subjected to many improvements, chiefly in the more careful preparation of the drugs themselves, and in their dosage; while from time to time newer combinations of the two alkaloids have been substituted.

Narcophine—a narcotine-morphine-meconate; and pantopon—a solution of the soluble chlorides of the alkaloids of opium—have been recently substituted for the ordinary hydro-chloride, or bi-meconate of morphia. These newer drugs, narcophine or pantopon, are used with the scopolamine in the initial injection; and spartein has been added, by some clinicians, as a cardiac stimulant. These several drugs have their special advocates, and special advantages are claimed for each of them. In consequence, it can truthfully be said that the perfect combination has not yet been attained.

Tocanalgine has been introduced by the French. This is a drug obtained by the action of living ferments on the chlorohydrate of morphine, and is strongly recommended by the French obstetrician Dessaignes. It is used alone, without scopolamine, and the results of its administration are designated "painless childbirth in France;" and it is even now being tried in America, with satisfactory results, by A. M. Hellman and others.

From the foregoing it is evident that the Freiburg *Dämmerschlaf* has already undergone numerous modifications, that the method is really still in a state of development.

It is also just to recall here the fact that scopolamine itself is not a new drug, though the related alkaloids of belladonna and hyoscyamus are much better known. As long ago as 1899 Schneiderlin recommended the use of scopolamine, combined with morphia, for the production of surgical anæsthesia; and it has been used in surgical practice, either by itself or as an adjuvant to ether administration, to some considerable extent since that time. *Dämmerschlaf*, or Twilight Sleep, is really merely the application of these two drugs, scopolamine and morphia (or its associate alkaloids) to the pains of labour. Atropine, the older alkaloid, with or without morphia, has long been employed as a sedative in parturition. It supplanted the use of chloral, which at one time was almost universal; and now in its turn, its place is taken by scopolamine. Viewed in this perspective the use of scopolamine and morphia in labour can be defined as a natural evolution in drug administration.

The "great discovery" of Twilight Sleep consists then merely in the application of these two drugs to the clinical phenomena of labour, and in the determination of a definite and safe method of their employment for both the mother and the child. As yet, this method has been most extensively used in the Freiburg clinic, for last year some five thousand cases were reported. The credit of the method, and the name—and truly it is a wonderful name—belongs to Gauss, to Krönig the chief, and to Siegel, an associate in the clinic.

This, very briefly, is the position of Twilight Sleep in the medical profession to-day. It is being conscientiously tested by many observers in the hospital services of America; and it goes without saying that the method will stand or fall on its merits.

Very unfortunately a year ago Twilight Sleep fell, in this immature state, into the columns of the lay press. Therein it was heralded as one of the world's greatest discoveries—a universal anodyne in child-birth. Newspapers and periodicals vied with each other in the exploitation of its virtues, and before the war there was no subject of such universal interest. Even Friedmann's "cure" of tuberculosis, a lamentable memory, met with nothing like the same hearty response.

This is scarcely to be wondered at, for this new method was glowingly described in these lay pages as a magical succour to all womankind in her hour of travail. The primal curse, "I will greatly multiply the sorrow of your conception; in sorrow thou shalt bring forth children," was to be finally abrogated. The bearing of a child was henceforth to be merely a time of twilight and of sleep. One can imagine what a special paradise of salvation this promise conveyed to that vast number of women who, as matrimonial candidates, are consciously unwilling, or unfit, for the claims of parturition; that vast array of modern womankind with no physical or mental training for the demands of motherhood; who are enmeshed, as Walt Whitman so well describes it, "in the incredible holds and webs of silliness, millinery, and every kind of dyspeptic depletion." For such a prospective mother this method afforded a glimpse into a maternal paradise.

The medical profession was taken by storm, and for a time there was no staying this popular deluge. Gradually, however, the harm of this lay-missionary enterprise is being undone; and saner counsels are coming to prevail. To the credit of the medical profession be it said that, in comparatively few cases did its members yield to this indiscriminate demand, with no thought of their own inexperience and with no regard for the hidden dangers to the mother and her child. In consequence, there are throughout the land comparatively few tombstones on which may be written the expressive words of Dr. W. H. W. Knipe, of the Post-Graduate Hospital, New York: "Erected to the memory of Twilight Sleep, and to the sympathetic physician who tried to do better than he knew."

The semi-narcosis induced by scopolamine and morphia has, I think, a distinct place in modern obstetrics. It may be said at once that it is not applicable to every case. The indications for its use, and its limitations, are being gradually developed; and, in experienced hands, the results are extremely satisfactory. For the past year this method has been employed in the Montreal Maternity Hospital, and our experience of its employment is shortly to be presented to the pages of this JOURNAL.

THE DESCRIPTIVE CATALOGUE OF THE MEDICAL MUSEUM OF McGILL UNIVERSITY

THE section of this catalogue on the Hæmopoietic Organs (the first to appear in print, although the fourth in the order of the museum classification) has just been issued by the Oxford University Press. This has been done under the personal supervision of Sir William Osler, and its cost has been met by a fund raised by him for this purpose among the medical graduates and friends of McGill University. The publishers have done their work extremely well, and the result is a thoroughly presentable volume, provided with numerous and excellent illustrations.

This catalogue has been arranged and edited by Dr. Maude Abbott, the curator of the museum. Though called a catalogue, it is really much more than this, and its publication is, we believe, an event of real importance, not only to the McGill Medical School in particular, but to museum organization and medical teaching as well.

In the large undertaking of cataloguing the McGill Medical Museum, Dr. Abbott has instituted and proceeded upon the following general and broad plan. A teaching series of specimens in all subjects is to be collected and systematically described and catalogued in accordance with a uniform standard, this description to include macroscopic and microscopic details, with both the specimen and its microscopic slide made available for the student. Moreover, to the description of each specimen the clinical data are attached, and so the work of the clinician and pathologist are in each instance combined. In addition each section (and each series in the section) in the museum catalogue is to be provided with a short introduction, dealing with the general pathology of the special subject, and the whole work to receive the *imprimatur* of the professors of pathology, of medicine, and of surgery. Such a plan is supported by the example of the University College Hospital and other English museums, and affords a wide departure from our previous conception of a catalogue; and it will provide a conspicuously instructive manual for the use of all students of medicine.

Dr. Abbott's broad ideal is fairly realized in the present volume. Here is presented a collection of carefully selected material, illustrating the subject with which it deals. By the uniformity of its arrangement, the logical sequence of its material, the careful chronicling of macroscopic and microscopic details, and the faithful coördination of its clinical and pathological data, this volume sets a higher standard of cataloguing than has, within our knowledge, hitherto been attempted in any medical museum. It so marks a step in the evolution of objective teaching methods, and the medical faculty of McGill University is to be congratulated on its appearance.

The introductions and the descriptions of many of the specimens are by Professor O. C. Gruner, formerly pathologist to the Royal Victoria Hospital; and there are several admirable colour sketches by Dr. Gruner himself. The timely appearance of this volume has been largely due to the activity and generous collaboration of Professor Gruner, and its subject-matter is of particular interest because it is one which he has made especially his own.

There is presented in this volume for the first time the practical application of the expansive museum classification suggested by the late Professor Wyatt Johnston, and in use for many years in the museum.

While it is true that much of the descriptive work in this volume is from the hand of the curator of the museum, this does not by any means indicate the services rendered by Dr. Abbott. For, not only was the original conception of such a catalogue her own, but, in all justice, it may be said that its actual creation has been due to her skill, energy, and devotion. When complete, this catalogue of the McGill Medical Museum will constitute no mean life-work.

The story of Sir William Osler's part in the publication of this catalogue is typical of himself. His interest in the McGill Museum dates from the beginning of his career, for it was here, in 1874, that he did his first pathological work. The foundations of his knowledge of clinical medicine may truly be said to have been laid in the post-mortem room of the Montreal General Hospital where he served as pathologist from 1877 to 1884. From this extensive pathological service he collected the material for his Goulstonian lectures on malignant endocarditis, which constituted his first important contribution to the literature of this subject, and which still remain a classic. During this time his interest in the museum grew; and its shelves are rich with specimens secured at this time by himself.

Since those days Sir William Osler has furthered in many ways the museum's interests. He has always been a generous benefactor. And when, in 1905, Dr. Abbott proposed the publication of this original and extensive catalogue, the scheme met with his instant approval. With characteristic promptitude he at once issued a circular to the medical graduates and friends of McGill University, asking for contributions to defray the cost of such a publication. The answer to this appeal was a fund of $1,200, which was designated as a Catalogue Fund. It is with part of this money that the present volume has been issued. It is extremely satisfactory to know that sufficient money remains to publish the second volume on the circulatory system, which will shortly be issued, and which will receive a special interest from the fact that many of the specimens have been prepared and presented by Sir William Osler himself.

ON THE AMOUNT OF BUTTER FAT IN ICE CREAM

THE manufacture of ice cream is becoming an important industry in Canada and is undoubtedly of much value to the dairy interests in the Dominion. Conservative estimates of the amount of ice cream manufactured and consumed in Canada place it considerably over five million gallons in 1914. It thus forms an important element in our food products, and therefore demands that its composition shall be under inspection by the government, and that such a standard of purity and quality be maintained that the public shall be ensured a good and wholesome article.

When first the industry began to assume importance it was decided by the government that under the term ice cream is implied a product consisting of pure frozen cream with sugar, and a standard percentage of 14 per cent. butter fat was demanded. This involves the employment of a cream of high grade, and the addition only of the requisite amount of sugar and flavouring. Such a high standard of butter fat it is claimed by the manufacturers is detrimental to the development of their industry. The term ice cream, they assert, does not necessarily call for a purely sweetened and frozen cream, but according to the dictionaries and to all the standard cookbooks, permits a wider variety of ingredients, the term cream being employed by confectioners with great freedom as a term "for any delicacy for the table resembling cream or made in part of it, as ice cream; an article of creamy consistence" (Standard Dictionary). Evidence has also been produced which indicates, according to their statements, that the public prefers an article with distinctly less butter fat. Under these circumstances the government has yielded temporarily, and pending an investigation of the fact by their officers, has placed for the time being the percentage of butter fat at a minimum of 7 per cent.

We desire here to call attention to the letter on this subject which appears in this month's issue. It is certainly incumbent upon the profession to pass an opinion upon the suitability of ice cream of a high, moderate, or low per cent. butter fat when taken as a dessert or light refreshment. That opinion is best founded upon the amount of butter fat which can be taken in a light refreshment without interfering with its digestibility. In small amount, and taken with other food at the regular meal hour, ice cream of a high fat percentage may be taken and relished by the great majority of individuals. Consumed, however, as a great quantity of it is by the young, as a refreshing sweet, between the hours of the regular meals, we are convinced that ice cream of high fat percentage is much more liable to disturb the stomach and interfere with the digestion of other food, than an ice cream of moderate fat percentage (e.g. 7 to 8). We have seen several cases in children of recurrent vomiting, and of intestinal catarrh, which in our opinion were attributable to a free use of a rich ice cream; and we believe that in almost all children food with such a high percentage of butter fat, unless used in a very sparing manner, is liable to interfere with the digestion of other foods, and thus to impair rather than increase general nutrition. We are also of the opinion that ice cream when used as a food in sickness and convalescence will be more acceptable to the weakened stomach if it contain only 7 per cent. or 8 per cent. butter fat, and at the same time a somewhat higher percentage of proteid, than a cream of 14 per cent. butter fat and lower proteid, and will in the end prove more nutritious to the patient.

A Committee for the relief of Italian wounded has been organized by Americans resident in Florence. The use of the historic Villa del Sole di Camerata has been placed at the disposal of the committee and had been converted into a hospital of one hundred beds. With the coöperation of Americans at home, the committee hopes to be able to maintain the hospital as long as it is needed.

The second Harvard surgical unit sailed from New York on June 26th, and is now in charge of a British base hospital in France. Lieutenant-Colonel Sir Allan Perry, R.N.M.C., is in official command of the hospital. Dr. Edward H. Nichols, the surgeon-in-chief, who was to return to the United States about the beginning of this month, has been relieved by Dr. Franklin G. Balch, of Boston. The members of the first unit returned from France in July.

A few weeks ago Mr. Asquith stated in Parliament that the death rate among the wounded in the present war amounted to 24 per cent. This is higher even than in the Crimean War, when the rate was 22 per cent. The explanation, of course, lies in the fact that in trench warfare it is impossible to give timely help to the wounded, who fall on the ground between the trenches of the opposing forces. Moreover, the least movement on the part of the wounded reveals his whereabouts to the enemy, and it is only under cover of darkness that he is able to crawl back to the trenches or to obtain any assistance.

The Australian Hospital at Harefield Park, Middlesex, with a capacity of almost five hundred beds, is a splendid example of what can be done now-a-days with movable, inexpensive structures. The house and grounds were given by an Australian gentleman for a hospital for wounded soldiers from the Commonwealth. The house has been converted into an administration building and on the grounds wooden structures with light iron girders for framework have been erected. Creosoted wood sleepers form the foundation and the walls, floors, and ceilings consist of five foot sections which fit into each other, so that a ward can be easily made larger or smaller as required by adding or taking away some of these sections. The material used is light and easily portable and can be packed into a small compass; moreover, should any portion be damaged by a shell it can be reconstructed promptly and without difficulty.

The American Red Cross has announced its intention to withdraw, on October 1st, next, fourteen of its units from the countries engaged in war. Two units will be left in Belgium where it is believed the need is most urgent and the work of the Serbian sanitary commission will be continued, as this has been provided for by special contribution. This decision has been made because the general fund, which aggregates $1,565,000, by that time will have been exhausted. Since the commencement of the war, seventy-one surgeons, two hundred and fifty-three nurses, and forty-three members of the Serbian sanitary commission, have been sent overseas by the American Red Cross, and the administrative expenses alone have amounted to over $11,000. In addition, 1,000,000 pounds of cotton, 882,000 yards of surgical gauze, 727,000 assorted bandages, 33,000 yards of adhesive plaster, 9,240 stretchers, 10,267 blankets, 19 motor ambulances, 4 army field hospital outfits, 50 army hospital tents, and 30 field medical tents have been supplied to the belligerent countries.

The Paris Chamber of Deputies has passed a bill making an appropriation of two million francs to be expended upon the care and treatment of soldiers discharged or about to be discharged because they are suffering from tuberculosis. In England, a home for men, who through exposure in the trenches have contracted the disease, is in process of equipment by the Wounded Allies' Relief Committee. This committee has done a great deal to alleviate suffering caused by the war. It brought over the first Belgian wounded to England and found hospital accommodation for sixteen hundred of them. It has done valuable work in assisting in tracing scattered Belgian families, and by compiling a register of soldiers' names, addresses, regiment, etc. It has also provided a number of artificial limbs and surgical appliances. It maintains two hospitals in France, at Dieppe and at Limoges, and early in the year it sent a fully equipped typhoid hospital to Kragujevatz, in addition to financial assistance to the Serbian Government. On June 2nd, the committee despatched two units of one hundred beds each to Montenegro, to assist in quelling the typhus epidemics at Podgoritza and Nikshich. These units took with them food and supplies to the value of over twelve thousand dollars.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

MODERN MEDICINE: Its theory and practice in original contributions by American and foreign authors. Edited by SIR WILLIAM OSLER, BART., M.D., regius professor of medicine in Oxford University, England; and THOMAS MCCRAE, M.D., professor of medicine in the Jefferson Medical College, Philadelphia, second edition, thoroughly revised. Vol. V. Diseases of the nervous system—Diseases of the locomotor system. Lea and Febiger, Philadelphia and New York, 1915.

NERVES. By DAVID FRASER HARRIS, M.D., C.M., B.Sc. (Lond.), D.Sc. (Birm.), F.R.S.E., professor of physiology in the Dalhousie University, Halifax, N.S. Williams and Norgate, London.

PRACTICAL MEDICINE SERIES. Edited by CHARLES L. MIX, A.M., M.D. Chicago: Year Book Publishers, 1915. Vol. III. EYE, EAR, NOSE AND THROAT. Edited by CASEY A. WOOD, C.M., M.D., D.C.L., ALBERT H. ANDREWS, M.D., and WILLIAM L. BALLENGER, M.D. Price, $1.50.

REPORTS FROM THE LABORATORY OF THE ROYAL COLLEGE OF PHYSICIANS, EDINBURGH. Vol. XIII. Edited by J. J. GRAHAM BROWN, M.D., and JAMES RITCHIE, M.D. Oliver and Boyd, Edinburgh, 1915.

TEXT-BOOK OF FORENSIC MEDICINE AND TOXICOLOGY. By R. J. M. BUCHANAN, M.D., F.R.C.P. (Lond.), professor in forensic medicine and toxicology, University of Liverpool, eighth edition, revised and enlarged. E. S. Livingstone, Edinburgh, 1915. Price, 7s. 6d. net.

APPLIED IMMUNOLOGY: The practical application of sera and bacterins prophylactically, diagnostically and therapeutically, with an appendix on serum treatment of hemorrhage, organotherapy and chemotherapy. By B. A. THOMAS, A.M., M.D., professor of genito-urinary surgery in the polyclinic hospital and college for graduates in medicine, and R. H. IVY, M.D., D.D.S., assistant instructor in surgery in the University of Pennsylvania. Philadelphia and London: J. B. Lippincott Company, 1915. Price, $4.00.

INTERNATIONAL CLINICS: A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pædiatrics, obstetrics, gynæcology, orthopædics, pathology, dermatology, ophthalmology, otology, rhinology, laryngology, hygiene, and other topics of interest to students and practitioners. By leading members of the medical profession throughout the world. Edited by HENRY W. CATTELL, A.M., M.D., and others. Vol. II, twenty-fifth series, 1915. Philadelphia and London: J. B. Lippincott Company.

A COMPEND OF MEDICAL CHEMISTRY, INORGANIC AND ORGANIC, INCLUDING URINARY ANALYSIS. By HENRY LEFFMANN, A.M., M.D., professor of chemistry in the Woman's Medical College of Pennsylvania. Sixth edition, revised. Philadelphia: P. Blackiston's Son & Company. Price, $1.00 net.

MODERN ASPECTS OF THE CIRCULATION IN HEALTH AND DISEASE. By CARL J. WIGGERS, M.D., assistant professor of physiology in Cornell University Medical College, New York City. Illustrated with 104 engravings. Lea and Febiger, Philadelphia and New York, 1915. Price, cloth, $3.75, net.

THE PRACTICAL MEDICINE SERIES, comprising ten volumes on the year's progress in medicine and surgery. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. IV, GYNECOLOGY. Edited by EMILIUS C. DUDLEY, A.M., M.D., professor of gynecology, Northwestern University Medical School, and HERBERT M. STOWE, M.D., assistant professor of obstetrics, Northwestern University Medical School. Series 1915. Chicago: The Year Book Publishers, 327 S. La Salle Street. Price, $1.35.

Obituary

Dr. Jean A. Desjardins, of Montreal, died August 7th, in the seventy-seventh year of his age. Dr. Desjardins was born at Vaudreuil; he graduated from Laval University in 1862, and went into practice in Montreal.

Dr. Jean Baptiste Comeau, of Farnham, Quebec, died August 7th, in the sixty-eighth year of his age. Born at St. David Quebec, he was educated at Nicolet College and later entered McGill University where he received his medical degree. He practised at St. Germain for a time, and then went to Farnham. He leaves a widow and thirteen children.

Dr. Isaie Cormier, of Montreal, died suddenly on August 18th. Dr. Cormier, who was in the sixtieth year of his age, was born at L'Assomption, Quebec. He graduated from Laval University.

News

ARMY MEDICAL SERVICES

No. 5 General Hospital, C.E.F., was inspected by General Lessard, of Winnipeg, the Inspector-General of the Western Forces, on August 2nd, last. Major Hart, who is in command of the unit, has been gazetted lieutenant-colonel, as have also Majors Herman Robertson, of Victoria, and F. C. McTavish, of Vancouver. Captains H. L. Burris, of Kamloops, H. S. Monro, F. P. Patterson, and A. P. Proctor, of Vancouver, have been given the military rank of major. A few changes have been made in the personnel of the hospital; Captain Hogle, of Vancouver; Captain Sutherland, of Revelstoke, and Captain Manchester, of New Westminster, will not accompany the unit but it will be joined in Europe by Lieutenant-Colonel Tanton, Major Gillies, and Captain Taylor, who are already at the front. Miss F. Wilson, formerly lady superintendent of the Winnipeg General Hospital Training School, is the matron, assisted by Miss Tripp and Miss Campbell, of Victoria.

THE following physicians have joined the Royal Army Medical Corps: Dr. G. Belfie, of Seeley's Bay, Ontario; Dr. Edward Kidd, of Trenton, Ontario; Dr. W. V. Coffyn, of Newcastle, New Brunswick; Dr. Deyell, of Lindsay, Ontario; Dr. L. A. Benner, of Winnipeg; Dr. H. F. Mackendrick, of Galt, Ontario; Dr. James L. Wilson, of Toronto; Dr. W. E. Ainsley, of Vancouver; Dr. D. A. Volume, of Erskine, Alberta; Dr. W. G. G. Campbell, Dr. Williams, Dr. J. D. Adamson, of Winnipeg; Dr. John R. Irwin, of Cobourg, Ontario; Drs. F. R. McKim, J. F. Sadler, D. S. Cassidy, D. Creighton, C. B. McTavish, A. M. Davidson, J. Wood, and J. B. Haverson, of Winnipeg.

No. 1 Stationary Hospital, under the command of Lieutenant-Colonel Hanford McKee, of Montreal, and No. 3 Stationary Hospital, under the command of Colonel Casgrain, of Windsor, Ontario, have been sent to the Dardanelles.

DR. A. M. FISHER, of Woodstock, and Dr. L. deC. MacIntosh, of Hartland, Ontario, who recently joined the Royal Army Medical Corps, have gone to Egypt.

LIEUTENANT-COLONEL A. R. GORDON, who accompanied No. 4 General Hospital to England, has returned to Toronto on account of ill health.

CAPTAIN GEORGE B. STRATHY, of Toronto, who left for England with No. 2 Clearing Hospital, is in charge of cases of infectious disease at Moore Barracks, Shorncliffe.

MAJOR E. B. HARDY, of Toronto, is in charge of No. 2 field ambulance in Belgium.

DR. V. E. HENDERSON of Toronto, has been appointed head of the Alien Prisoners' Detention Camp at Kapuskasing, Ontario.

DR. J. W. S. MCCULLOUGH, of Toronto, has been given the temporary rank of major while in charge of the sanitation at the Niagara military camp.

Captain L. G. Palmer is in command of Section B, No. 2 Field Ambulance.

Dr. W. D. Sharp, of Brampton, Ontario, has been appointed to the staff of a hospital in Serbia.

Dr. Howard D. Harrison, of Milton, Ontario, has been gazetted major in the Royal Army Medical Corps. Dr. Harrison, who was doing post-graduate work in England when the war commenced, is now surgeon at the Welsh Metropolitan War Hospital, London.

Dr. G. H. Bowlby, of Berlin, Ontario, has left for service overseas.

No. 5 Stationary Hospital (Queen's) under Lieutenant-Colonel F. Etherington, has arrived safely in Alexandria, Egypt.

Dr. C. H. Valery, of Edmonton, has been appointed chief of the medical service of the fifty-ninth division of the French army. He has been serving as medical officer of a regiment of heavy artillery stationed at Pont-à-Mousson.

Dr. Howe A. Jones, of Salisbury, New Brunswick, is taking a military course at Halifax preparatory to joining a medical corps overseas.

Dr. W. T. Connell, of Kingston, who accompanied No. 5 Stationary Hospital, has been gazetted lieutenant-colonel.

The physicians of Hamilton are contributing the funds necessary for the purchase of a machine gun for service overseas.

Lieutenant-Colonel Herbert A. Bruce, of Toronto, is now attached to the medical service of the Canadian Expeditionary Force.

Captain Hervey Jackes, of Toronto, has been appointed Deputy Assistant Director of the Canadian Medical Service.

Lieutenant-Colonel G. S. Ryerson, of Toronto, has been gazetted honorary surgeon-general.

Lieutenant D. E. Staunton Wishart, R.A.M.C., son of Dr. D. J. Gibb Wishart, of Toronto, has been ordered to the Mediterranean.

Captains J. Petitclerc, W. J. N. Wright, Z. R. Gauthier, and Jules Lafleur have joined the French-Canadian Stationary Hospital, No. 4, which left Montreal on May 6th, under the command of Lieutenant-Colonel Mignault.

The Stationary Hospital offered by Laval University has been accepted by the War Office. Lieutenant-Colonel George E. Beauchamp, of Montreal, will be in command of the unit, which is in process of organization.

Lieutenant-Colonel J. O. Orr, of Toronto, has volunteered for service with the Army Medical Corps, either at home or abroad. Dr. Orr was appointed provisional lieutenant in the Army Medical Corps in 1894 and was gazetted lieutenant-colonel last May.

Dr. John R. Whitman, of Brantford, Ontario, has been granted a commission in the third university overseas battalion.

Lieutenant L. S. Foster, A.M.C., is the medical officer of the 73rd Battalion Royal Highlanders of Canada, which is being recruited in Montreal.

Captain D. B. Neely, M.P., of Humboldt, Saskatchewan, has joined the Army Medical Corps and will be attached to the 10th Canadian Mounted Rifles, at present in training at Camp Hughes, Manitoba.

A provisional school of instruction for officers of the Army Medical Corps has been opened at Niagara-on-the-Lake, under the direction of Lieutenant-Colonel F. Marlow. Among those in attendance are, Drs. F. A. Cleland, G. W. Carleton, H. C. Hall, B. P. Matthews, W. J. Naber, McCormack, McKilgow, P. W. Phillips, W. M. Robb, H. P. Rogers, S. O. Rogers, F. G. Thompson, F. G. Wonbridge, and C. R. Young, of Toronto; Dr. J. A. McCampbell, of Waubaushene; Dr. F. A. Ross and Dr. W. A. Lewis, of Barrie; Dr. G. T. Bailey, of Cochrane; Dr. W. J. Kirby, of Englehart; Dr. H. H. Harrier, of Coldwater; Dr. H. W. Armstrong, of Brampton; Dr. D. M. Baker, of White River; Dr. J. P. Russells, of Timmins; Dr. L. C. Lauchland, of Dundas; Dr. J. R. McLean, of Sault Ste. Marie; Dr. T. A. Gourlay, of Cayuga; and Dr. F. J. Matthews, of Brooklyn, New York.

A SITE has been chosen at Orpington, Kent, for the hospital which is to be established in England by the Province of Ontario. Orpington is about fifteen miles from London and only a short distance from Dover and Folkestone.

THE Distinguished Service Order has been awarded to Captain Stanley Alwyn Smith, of Winnipeg, for conspicuous gallantry and devotion to duty at Festubert on the night of May 20th. Captain Smith, with a party of eight men, volunteered to remove some wounded men from an orchard under heavy fire and succeeded eventually in bringing them all back to safety.

CASUALTIES

Died of Wounds

MAJOR J. L. DUVAL, St. John, New Brunswick (First Field Ambulance).

Wounded

LIEUTENANT-COLONEL GARDNER, C.A.M.C., wounded in leg and invalided home.

Correspondence

BUTTER FAT IN ICE CREAM

To the Editor,

CANADIAN MEDICAL ASSOCIATION JOURNAL.

SIR,—The question as to how much butter fat ice cream should contain is under investigation by the Department of Inland Revenue in Canada. By the statutes as they read at present it is demanded that ice cream should consist essentially of frozen cream and sugar, that no milk either pure or condensed, no eggs, and no starch, should be permitted to enter into its composition; and that it should contain 14 per cent. of butter fat.

From a physician's point of view it appears to me that this amount of butter fat is unduly high for a delicacy used in the amount that ice cream is both with and between meals by a great many people, and when of such richness must have the tendency to upset many stomachs. Moreover, when employed as a nutriment in fever and during convalescence an ice cream of lessened richness would be more easily digested by, and therefore more acceptable to a stomach whose powers have been impaired by illness, than one containing such a high percentage of butter fat.

An expression of the views of members of the profession on this matter either by letter direct to the writer or through the JOURNAL will assist the department in arriving at the most suitable standard.

We are informed that the United States Government has the matter also under investigation. Many of the States have at present no legal standard for the amount of butter fat in ice cream. In Massachusetts it is 7 per cent. In Pennsylvania it is 8 per cent. In Illinois, after an investigation, 8 per cent. was determined upon as its standard.

Yours truly,

A. D. BLACKADER.

236 Mountain Street, Montreal, August 11th.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Practitioner and Review, June, 1915:

President's Address, Ontario Medical Association	D. J. Gibb Wishart.
The diagnosis of chronic intestinal stasis	Wm. Goldie.
The medical treatment of intestinal stasis	J. Third.
Chronic intestinal stasis	G. A. Bingham.

The Canadian Practitioner and Review, July, 1915:

The cancer problem	J. Ferguson.
The relation of school children to the anti-tuberculosis campaign	J. H. Holbrook.

The Canadian Practitioner and Review, August, 1915:

Cancer of the uterus with special reference to diagnosis	G. Stewart Cameron.

Some observations on blood pressure . A. T. Emmerson.
The early signs of tuberculosis . . . J. H. Holbrook.
Mobilization in medicine . . . . . J. Hunter.
Tuberculosis problems from a public health standpoint . . . . D. A. Craig.

Dominion Medical Monthly, May, 1915:

Renal caculi in women . . . . . A. C. Hendrick.
Prostatectomy . . . . Wm. Gunn.

Dominion Medical Monthly, June, 1915:

Presidential Address, Ontario Medical Association . . . . . D. J. Gibb Wishart.

The Canadian Journal of Medicine and Surgery, July, 1915:

Address on Surgery . . . . . F. J. Shepherd.

The Canadian Journal of Medicine and Surgery, August, 1915:

The attitude of the surgeon to prevention of cancer . . . . H. A. Bruce.

Dominion Medical Monthly, July, 1915:

Treatment of the fever heart . . . . H. B. Anderson.
Observations from twenty-four cases of exophthalmic goitre—A new symptom D. Smith.

The Canada Lancet, June, 1915:

Presidential address, Ontario Medical Association . . . . . D. J. Gibb Wishart.
Some errors in diagnosis . . . . . J. J. Thompson.
Observations from twenty-four cases of exophthalmic goitre—A new symptom D. Smith.

The Canada Lancet, July, 1915:

The nurse . . . . Hon. W. R. Riddell.
Address on Surgery . . . . . . F. J. Shepherd.
Some of the troubles of a rural medical officer of health; and their remedy . M. Powers.
The ocular manifestations of a disseminated sclerosis, with report of a case . C. Campbell.

The Canada Lancet, August, 1915:

Diphtheria: its dissemination, prevention and cure	J. F. Hanly.
The new serum treatment for epilepsy .	W. Held.
Some observations on blood pressure .	A. T. Emmerson.

Western Canada Medical Journal, May, 1915:

Analysis of forty-one cases of sinus disease.	G. W. Fletcher.
Colectomy, in autointoxication . .	E. Hall.

Western Canada Medical Journal, June, 1915:

Narcotic drug addiction	G. E. Pettey.
An analysis of narcotic drug addiction .	E. S. Bishop.

Medical Societies

CANADIAN PUBLIC HEALTH ASSOCIATION

Last year, owing to the outbreak of war in August, the Executive Committee of the Canadian Public Health Association reluctantly decided to postpone the annual meeting of that body. This year, although so many members of the Association are on active service. it is felt that it would be inadvisable to let another year pass without arranging a meeting. An effort was made to meet in conjunction with the Canadian Medical Association at Vancouver in May. This plan fell through, however, when the meeting of the Canadian Medical Association was postponed. The Executive has now decided to hold the fourth congress of the Canadian Public Health Association in Toronto, on the 3rd and 4th of this month. As so many members have joined the forces, the attendance will naturally be less than usual, but it is hoped that all those who possibly can do so will attend the meetings.

SASKATCHEWAN MEDICAL ASSOCIATION

The Annual Meeting of the Saskatchewan Medical Association has been postponed until after the close of the war. The meeting this year was to have been held at Moose Jaw on the 27th of July, under the presidency of Dr. George P. Bawden. Dr. C. G. Sutherland, the secretary of the Association, is at the front.

MEDICAL SOCIETY OF NOVA SCOTIA

The following are abstracts of papers read before the Medical Society of Nova Scotia, at its sixty-second annual meeting at Amherst, on July 7th and 8th, 1915.

Forty years plus, by Dr. W. H. Hattie, provincial health officer.

Reference was made to the reduction in the average age at death which has resulted from recent activites by public health authorities. In 1910 the average age at death in the United States was 38·7 years as contrasted with 35·2 years in 1900,—an addition to the average age of practically 10 per cent. English life tables prepared at the end of the last century showed an addition to the expectation of life of 9 per cent. for males and 12 2-3 per cent. for females, as compared with the expectation of life of the middle of the last century. An analysis of the statistics, however, shows that in the United States, at any rate, improvement has been effected only in the earlier age periods, and that the death rate has been increasing rather than decreasing in the age periods above forty. The English figures show a betterment at all ages. In the United States there has been a definite tendency to increased mortality from the degenerative conditions associated with the cardio-vasculo-renal system. A study of the Nova Scotia statistics shows a tendency to increase in these conditions, although in a much less pronounced degree than in the United States. The conditions which appear to be particularly responsible for the increase of these degenerative diseases were referred to, stress being laid upon the necessity for temperance in the use of alcohol, for care in the dietary, and for taking proper exercise to counteract the lessened muscular activity which has resulted from the introduction of such modern conveniences as the telephone, the electric tram, the motor car, the elevator, the free delivery of mails and the numerous labour-saving devices which have recently come into use. Cancer, which has apparently become more prevalent in other countries, does not appear to be increasing in frequency in Nova Scotia. The great desirability of early diagnosis both in cancer and in the degenerative conditions was emphasized, and periodical, methodical medical examinations of those above the age of forty was recommended. Emphasis was laid upon the increasing value of human life especially in consequence of the war, and an appeal was made to the patriotism of every British citizen to do all that lay in his power to make our people virile and vigourous in order that British supremacy might be maintained.

Artificial pneumothorax in the treatment of pulmonary tuberculosis, by Dr. A. F. Miller, Superintendent Provincial Sanatorium, Kentville.

Dr. Miller reported his experience, during the past two years, of thirteen patients treated with injections of nitrogen gas. Ten were in the far advanced stage of tuberculosis and three in a moderately advanced stage. Seven of these patients were greatly benefited by treatment and six received no benefit whatever, as the disease was too extensive and pleural adhesions prevented the compression of the lung with gas. His most striking successes were obtained in severe hæmoptyses with recovery of patients on whom the operation was performed. The puncture method of Forlanini was employed in all cases and accidents so frequently reported in the literature were not met with. He attributes this to the rigid technique used. The only complication arising was pleurisy with effusion that occurred in one case at the end of a year's treatment. In his concluding remarks he stated: "The number of treatments and the time over which the work has extended does not permit us to advance definite conclusions as to its value in pulmonary tuberculosis. We have had our failures and dramatic successes amongst the cases treated. As long as compression is left for those in a hopeless condition the results will not be brilliant. If strict unilateral cases are selected for treatment, preferably those in a first or second stage of tuberculosis who are not responding to institutional management, the outcome will be much more satisfying. The results and possibilities of pneumothorax are encouraging and just as soon as an *x*-ray apparatus is installed we shall follow this work more broadly and even more carefully than we have in the past."

Sarcoma; differential diagnosis and treatment.

Dr. Harmer, of Boston, presented a paper on sarcoma, a subject of which he has made a special study for the past six years. His communication was an accumulation of facts gathered from perplexities encountered in an experience of several hundred cases. In considering differential diagnosis and treatment, therefore, he emphasized many points by illustrative cases. After briefly presenting opinions regarding etiology he cited two cases demonstrating the development of sarcoma upon chronic inflammatory processes; first, upon syphilis of the face, and second, about the sinus tract of an old osteomyelitis. An extensive operation for the old trouble in the second case had been done five years previously by Jones, of Liverpool. A sinus persisted due to a small cavity. About this tract a spindle-cell sarcoma developed. This was the size of a fist when seen by the author, and a subtrochanteric amputation was performed.

Under differential diagnosis were considered tuberculosis, syphilis, leukæmia, carcinoma, and benign growths. Two less usual cases which presented lesions closely simulating sarcoma in history, appearance, and consistency were related. They proved to be a huge low grade infection of the axilla associated with diabetes and an acute exacerbation of a chronic bursitis (inferior bicipital at head of fibula).

After general remarks on operability periosteal and medullary giant-cell sarcoma were considered. The notoriously poor results of periosteal sarcoma of the long bones, even after hip-joint and shoulder-girdle amputation, were reviewed. This is because the most refined diagnostic methods fail to reveal the presence of early metastases. A primagravida, twenty-nine years old, six and a half months pregnant, upon whom he performed an interscapulothoracic amputation for periosteal sarcoma just below the head of the humerus offered a pitiful example. A very careful complete physical examination and *x*-rays of the chest suggested that the process was still localized. The operation went smoothly and quickly. She was in excellent condition at the close, pulse 80, made an uneventful convalescence, was delivered at term of an apparently normal child by her physician. In nine months, however, she died of sarcoma which first appeared in the tibia and rapidly involved the femur and lungs.

The pathology of medullary bone tumours was considered at some length with special reference to the significance of giant cells. Despite conflicting opinions regarding the nature of myeloid growths, it is true that many can be cured by one or more curettings or resection. Others on account of size or situation may require amputation. Still others, probably the smallest group, cannot be cured by surgery alone (more or less extensive involvement of the vertebræ).

In a consideration of the treatment of inoperable sarcoma were mentioned arsenical preparations, caustics, cautery, the hot iron, fulguration, radium and allied substances, the mixed toxins of streptococcus and B. prodigiosus, and the *x*-ray. The author has personally treated about one hundred and twenty-five cases with the mixed toxins and has reviewed the literature on the subject. In previously published papers (*Bost. Med. and Surg.*

Jour., August 13th, 1914, March 4th, 11th, 18th, and 25th, 1915) he has made a critical analysis of his own and reported cases to determine the efficiency of the toxins. He briefly stated his conclusions. The author then showed a series of lantern slides illustrating the differential diagnosis of bone sarcoma and other osseous lesions.

Military sanitation as applied to farms, by Captain Victor F. Connor, A.M.C.

With a view to the possible amelioration of the sanitary conditions existing on farms, and, indeed, in towns also, Dr. Connor gave the following description of sanitary precautions taken in militia camps in times of peace.

A sanitary officer is duly appointed whose duty is to see that cleanliness is observed and that the regulations are obeyed, that the latrines, as the water closets are called, are fitted with the proper number of buckets, a certain percentage to the number of troops, each bucket to contain a sufficient quantity of disinfectant solution, generally Izal, to cover any excreta; incinerators built, garbage tubs and slop sinks installed in their places. This is done before and on the arrival of the troops, and is the first work done, a special squad being told off to do it. The incinerator is simply an outdoor fireplace made by digging two shallow trenches about six feet long and a foot wide and a foot deep, crossing each other at right angles. At the junction, iron rods are laid across, and by standing a barrel on these and building a wall all round the barrel, a sort of chimney is formed with underdrafts. The material to be destroyed is placed in the barrel and set on fire, and this burns the inner shell with the barrel, leaving the shape. This fireplace is cleaned out when necessary, and it is wonderful the amount of rubbish that can be and is burnt during the day. Garbage pails are half-barrels with holes bored in the bottom, set on similar crossed trenches, only in this case they are covered over carefully. This permits the liquid to run through and be absorbed by the ground, while the solids, bones and pieces of food, etc., are retained. These are either burnt or, when cleaned out, given to some one for their pigs. A cover is provided to keep out flies; in fact the slogan of the sanitary department is "starve the flies." These pails are emptied at least once a day. At each water tap, a similar tub is provided over a covered drain, and a sentry placed to prevent excessive waste. The shower baths are also located over a covered trench with a grating. The whole idea is to prevent odours and flies. The horse manure is either carted away at once or burnt in a large incinerator. The above is a rough sketch of the method taken in camp to preserve health. The portion I desire to lay particular stress on is the latrine or water-closet system. On farms the garbage and swill is generally utilized to feed pigs, but the incinerator might be installed in some places with benefit. A condition which obtains on many farms, and in houses in towns as well, is a small room or lean-to built on to the house, preferably near the kitchen or pantry, sometimes a shack a few yards from the back door, with a seat with one to four openings, perhaps with covers, perhaps NOT. This porch has a sort of door at the ground level at the back of the seat outside, and the excrement deposited when the closet is in use, is removed once in one or two years, rarely more often. Some think the time for removal is when the contents almost reach the closet seat. This condition permits flies to swarm, and the smell is not at all pleasant and is absorbed by the milk and food in the neighbouring pantry or kitchen. In other cases, the lower door is left open, or is altogether absent, and the hens keep the place cleaned out. If the closet can be placed near the pump which supplies the house, it seems to be considered so much the better. Is there any cause for wonder at typhoid occurring in the rural districts; rather is it not wonderful that there is not more? You who have country practices can, I am sure, call to mind many similar and even worse cases.

The following appears to be the simplest solution of the problem. Have the closets in use thoroughly cleaned out and well limed first, then install buckets to catch the excrement, and in summer keep in them a solution of some of the coal-tar disinfectants sufficient to cover the contents. This will destroy and prevent odours, and flies will not feed there. In winter, as the weather in Canada is often quite cool, and most of the farmers burn lots of wood and coal, the ashes may be used to absorb the liquid and cover the solids, on the principle of the dry-earth closet. There should be built a ventilating shaft, starting from beneath the seat and projecting above the roof; four six-inch boards nailed together would do, and the draught would carry off all odours. The pails could be easily withdrawn and emptied frequently; a small hole could be dug, and the contents emptied into it and the earth replaced. This would not be the disagreeable task that cleaning out the ordinary closet is. If some manufacturer of paper drinking cups made a large waterproof bag that would fit a large bucket, overlapping the edges, these could be used as linings and then closed over when being removed, thus preventing all nuisance and keeping the buckets perfectly clean.

This is a simple inexpensive way to cure a very common offensive condition, at the cost of a little lime, a couple of large buckets, a supply of disinfectant and paper linings, amounting to perhaps from $3 to $5 at first, and yearly afterwards a few cents for solution, instead of paying large doctor's bills, besides the extra economic loss of the labour and health of the persons incapacitated. A railway excursion within fifty to a hundred miles from the various camps for the farmers, with demonstrations, might be arranged.

Diagnosis of tubercular and other infections of the kidney, by Benjamin Tenney, M.D., F.A.C.S.

Patients with tubercular or other infections of the kidney consult a physician on account of frequent or urgent urination, pain, hæmaturia, or because of the presence of abnormal elements in the urine found in the course of some general examination. Of the three symptoms, frequent urination is most constant and corresponds with the diminished bladder capacity. This contraction of the bladder may be permanent, due to deposit of connective tissue between the muscle fibres, or temporary and due to a ureteral reflex. Pain may be absent. If present it is due to distension of the kidney pelvis or capsule, or there is complaint of the cramp of the bladder muscle which we call tenesmus. Pain in the loin is less common than tenderness to pressure. Pain in the bladder region is more common than tenderness to pressure. Microscopic hæmaturia is characteristic of the acute hæmatogenous infections, while the macroscopic hæmaturias belong to the destructive tubercular processes. The relation of hæmaturia to new growths and to renal stones must not be forgotten.

In the physical examination the presence of tenderness in the costo-erector angle, the presence of tumour or tenderness in the kidney region, tenderness along the psoas muscle, thickening of the ureter which is easily felt in women, thickening of the bladder wall, and tenderness of these last two structures, are all valuable signs when present. All may be found in one patient, some may be lacking in another, and only one or two present in a third. Their value can be estimated by the cystoscopic examination which should determine whether one or both kidneys are suffering, whether there be some coincident lesion in the bladder, or whether the conditions present in the bladder are responsible for the trouble higher up. The belief is growing that not only the tubercular but the more acute infections of the kidney are hæmatogenous, and evidence is accumulating that these infections cause trouble in kidneys whose ureteral drainage is impaired. The more we know of the bacteriology of the blood the more we find it to correspond with that of the urine. A tubercular kidney should be identified early and removed before the secondary bladder changes have become the primary cause of the patient's symptoms. Patients whose urinary fault is discovered in the course of some general examination will usually disclose some urinary symptoms under proper questioning, but in any case a complete examination will usually determine whether they are suffering from a present infection or from the results of a previous one. For proper examination of the urine we require a fresh specimen, passed by the male with due precautions as to urethral and preputial contamination or drawn by catheter from the female. Sediments should be obtained by centrifuge and examined before they are confused by the growth of yeasts and bacteria. Under these conditions we should regard the presence of red or white corpuscles as evidence which justifies full investigation as to their source. The presence or absence of albumen has less significance in the study of active infections than in estimating the damage done by some previous process. Finally, the injection of some of the sediment under the skin of a guinea pig's abdomen will determine the presence or absence of a urinary tuberculosis with a very small percentage of error. A non-tubercular renal infection if acute may require decapsulation, nephrotomy, or nephrectomy according to the general condition of the patient. A non-tubercular renal infection without fever may improve under horizontal rest and urinary antiseptics. Of these hexamethylenamin is the most used at present and if given until formaldehyde appears in the urine it will decidedly diminish the growth of the bacteria commonly found in these urines. For renal tuberculosis the only relief which nature can offer with our best assistance is to shut off the kidney and stop its function, and this is no better than the usual result. A closed tubercular kidney in the body is more dangerous than an open tubercular kidney in a jar. A tubercular renal infection which is producing urinary symptoms calls for nephrectomy like a malignant disease.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE fifteenth regular meeting of the Society was held Friday, May 7th, 1915, Dr. W. F. Hamilton, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

1. Carcinoma of the gall bladder,
2. Carcinomatosis of the mesentery,
3. Melanoma involving the heart,
4. Aneurysm of Circle of Willis,
5. Case showing advanced aortic stenosis.

DEMONSTRATION: Diseases of the ventricle. The electrocardiograph, presented by Dr. T. F. Cotton and Dr. J. C. Meakins.

CASE REPORT: Hæmorrhagic chicken-pox, by Dr. D. Grant Campbell.

THE sixteenth regular meeting of the society was held May 21st, 1915, Dr. W. F. Hamilton, president, in the chair.

The meeting took the form of a symposium on infant feeding and was opened by Dr. F. M. Fry on:

1. *General Principles—Whey and cream mixtures.*

Before stating formal principles I would like to emphasize that the only test of an infant's food is the result to the infants, measured by nutrition and growth. Hence we should not be satisfied with the statement that all is well because the food agrees.

A food may "agree" without nourishing and it becomes a physician's duty to see not only that the child retains the food with comfort but that food is given in such quantity and quality that nutrition and growth result.

It follows too, that no food can be tested unless it be given exclusively for at least six or eight months. For example children who were apparently doing well show, only after six months or more, anæmia, or malnutrition, or rickets, or scurvy. Let us then avoid passing judgement on a food until it has been given for a time long enough really to test its results.

As to general principles: I believe there are only two involved. The first is a truism granted, I am sure, by everybody, while if you grant the first you must grant the second. These principles are (1) The best and only standard food for the human young is human milk. (2) In the absence of breast milk, that food should be preferred which most resembles human milk.

How far from human milk the fashionable "foods" are, is obvious. Cow's milk itself is very different to woman's milk. The farthest removed from human milk of all the materials given to infants are the dead, dry, so-called proprietary "foods."

The search for a food as close to breast milk as possible brings me to whey and cream, for by the use of these two fluids we can get a mixture far closer to human milk than any food known to me.

Thus, whey as made in the Royal Victoria Hospital to-day, contains, in addition to the all-important ferments and other live products, fat ·40 per cent., sugar about 5 per cent. (casein 0) lactalbumin ·88 per cent., salts ·80 per cent.; cream contains fat 16 per cent., sugar 4 per cent., casein 3 per cent., lactalbumin ·50 per cent., salts ·80 per cent. A minute's calculation will show that

Sod. Citrat....................	1 grain
Lactose........................	½ drachm
Cream..........................	5 drachms
Whey ad.......................	3 ounces

is a mixture, which in comparison with human milk is as follows:

	Ferments, Etc.	Reaction.	Fats.	Lactose.	Casein.	Lactalbumin.	Salts.
Human Milk ..	+	alk.	3·50	7%	·60	1·20—1·8	·20
Whey Mixture ..	+	alk.	3·5	7%	·60	·82—1·42	·80

The best (whole) milk mixture may contain fat, sugar and proteids in the same amounts as in woman's milk, but these proteids are casein 1·50 per cent. and lactalbumin ·25 per cent. Theoretically then such a whey mixture is preferable. Apart from all theory, prolonged experience proves that whey mixtures give marked success where all milk mixtures (in difficult cases) fail. For example, experiments in the old Foundling Hospital gave such results that all the babies were given whey mixtures, with the result that, with no other change, mortality in one year fell 10 per cent. In a milk station in the slums results were equally striking. Most emphatic perhaps of all is the fact that several infants are to-day in the Royal Victoria Hospital who wasted for five to ten months on "proprietary foods," continued to lose for three weeks (in my care) on whole milk mixtures but showed rapid and steady gains for six to ten months on whey mixtures. Thus I succeed at once with whey in those children who fail rapidly and steadily on milk mixtures in my own practice.

Theory and practice are thus equally emphatic in giving the preference to such mixtures.

2. *Home modification of milk*, by Dr. D. J. Evans.

I thoroughly agree with what Dr. Fry has said concerning the importance of urging mothers to feed their children on breast-milk. I am not quite so strongly in favour of whey-cream mixtures as a food in all cases, but I do support a great deal of what has been said. First of all when it comes to feeding babies at home one has to take many things into consideration. In feeding young children one must have some very clear idea as to what the baby should be as a result of feeding a certain amount of food, i.e., what the general well being should be after a certain time of taking a certain food. There are many signs which will show that the child is not nourishing properly, and the man who is responsible for feeding a child should have a very clear idea as to the results he should obtain. The baby's weight, and age, are of importance; besides the weight you notice the condition of the child, the firmness of the flesh. If the child does not very soon begin to gain firmness of flesh, your food is still lacking in supplying the whole nutritional need of the child. It is the constant exercise of watchful care and the varying of the food from time to time that is important as the digestive power of children varies under certain external influences.

Dr. Fry has referred to a formula of milk, fats, proteids, salts, sugars, etc.; this varied capacity for digestion in children, will apply to any one of these elements in the food, and even breast milk children vary in their capacity to digest these various ingredients. For example, breast fed children may develop eczema, and in such cases we know that the fat in the mother's milk is probably at fault; in other cases a child may have an idiosyncrasy and cannot digest properly the fat content of the mother's milk, because it is in excess of the demand of that individual child. If we see these variations in the digestive power of fat, etc., in a child at the breast, we should not be surprised or discouraged on seeing the same in a child on an artificial food.

Children, too, are influenced by their environment very considerably. A child may receive a perfectly excellent food from one woman and yet not thrive as it ought, while on the same food given by another woman, of a quiet, peaceful, calm disposition and manner, the child would thrive and grow in a perfectly normal manner.

You must in home feeding separate your difficult case from your simply straight case of artificial feeding. It is not so difficult to feed a fairly healthy child, of normal standard, if it has not been already injured by bad feeding.

Now besides the standard of the baby there is that of the milk. A great many men do not give sufficient attention to the milk supply, but only to the care of the milk after it has been received in the home. In Montreal we have only one or two really good sources of supply and even in these the quality of the milk is liable to vary from time to time. After getting a good standard milk and attending to its proper care in the home, we then have to consider the preparation of the food. The important thing in feeding a child at home is care in detail in preparation of the food mixture. These details must be clearly understood by the person who is to prepare them. The directions should be simple and clear, and until the method is thoroughly mastered one should superintend the details in the preparation to see that nothing is left out.

As to the intervals between feedings. This is a matter of difference of opinion among many physicians. As a general rule it is conceded that cow's milk takes longer to be digested and carried out of the stomach than does human milk. It is therefore desirable in using this as a food to try to obtain a longer interval between feedings than with breast feedings. The breast usually is given every two hours in young children. I have lately employed a three hour interval with complete satisfaction, and many may obtain a four hour interval very quickly. This latter is what I endeavour to obtain with artificial food. The meal times may be, say, six in the morning, 10 a.m., two in the afternoon, and 6 p.m., and somewhere between ten and midnight. Five feedings in all per diem.

The quantity that one gives a child is another thing in which I find a great many go astray; a great many failures, even when the quality of the food is all right, are the result of giving too much at each feeding. There is a popular idea that a child should be allowed to "tank up" until it is overflowing. It is a better thing to have a definite rule to go by, and as a general working principle I hold that a child should be given, on the average, an ounce more than it is months old; I rarely give a child three months old five ounces unless it is a large, healthy, robust infant. That means of course that one must make a change every two weeks, in the amount of food the child gets, an increase of half an ounce at a time. You have to vary for different children, smaller quantities at shorter intervals, etc., may be necessary, but the longer interval between feedings is the ideal one.

Now as to the composition of the food. For the first three months it is a somewhat more difficult problem than after the child has passed that period, unless the child is in very bad condition. The composition of the food is of importance. For the first three months you must have a different standard from what you may give after that, but in general I am inclined to favour whole milk for ordinary cases, and only fall back on the whey-cream mixtures as a stop-gap in the more difficult cases. I replace the whey-cream mixture by a milk and barley food as early as possible.

Allen very wisely, some years ago, showed that it requires an amount of protein contained in one ounce of whole milk to the pound weight of the child to maintain the nitrogen equilibrium for twenty-four hours for an infant, and in order to build up the tissues in the child it requires the protein that is contained in one and a half ounces of milk to the pound weight of the child. Now as Dr. Fry spoke of breast milk as being his standard, so I may say that I also have a standard in my mind and that is, to give in a given case as much as one and a half ounces of whole milk to the pound of the child, and this I strive to reach. I may have to start with a whey-cream mixture, take the weight of the child and remember that in whey made from skim milk you get a protein content of 1½, or it may be 1·15 or even 1·25, and you can work out your quantities to make a suitable food mixture according to the digestive power of the child, working up the proteid gradually.

With regard to the fat in your mixture, the power of children to digest this is more subject to variation than is their power to digest protein matter. Even in robust children the fats often throw the digestive mechanism out of order. Sugars act in the same way but not so strongly. You have therefore to meet the individual needs of the child in respect to these. As a general rule I try to give the child, roughly speaking, 2 per cent. fat in the mixture and rarely exceed 3 per cent. to get ordinary good results. Usually in one and half ounces of whole milk to the pound weight of the child there is sufficient fat to supply the child's needs, and I very seldom have to add cream to the mixture, in fact, I have frequently to skim a little off the cream in order to get the required standard.

The sugar may be at fault and very often is given in too large quantities, when it leads to irritation by fermentation, producing eructations and looseness of the bowels and frothy stools. When the child gets to three months of age you may begin to use starch foods, dilute the excipient with starch, and often you get excellent results. Barley is the one I favour, but oatmeal flour, plain white flour well cooked, sometimes malt preparations, according to the idiosyncrasies of various children, are all valuable.

These general principles I have found during recent years to work very well in general practice, and as a rule I have very little difficulty in getting good results. You have to be attentive to the general condition of the child, to be familiar with the signs of indigestion, etc., and to combat anything wrong at once when it comes up; with this care and attention to detail you will meet with success.

3. *Proprietary foods*, by Dr. G. Gordon Campbell.

Dr. Campbell, having been out of town, was unable to prepare any notes on this subject and the president called upon Dr. A. E. Vipond for some remarks.

Dr. A. E. Vipond. As no time has been given me to put together any facts in this connexion I will only say a few words. According to the manufacturers all proprietary infant foods appear to have certain values, but from our point of view the results are, rickets, marasmus, wasting, and other evils. Most of these foods contain an excessive amount of starch and are low in proteids and fats.

First of all take condensed milk; it is very low in fats and the sweetened condensed milk has too much sugar. The following table gives the composition of the various proprietary foods now on the market,—it has been compiled by Dr. Leeds and is published in "The Diseases of Children," Goodhart and Still.

If the mother cannot nurse the child we should endeavour to modify cow's milk to bring it as near as possible to resemble the mother's milk. Every infant is an individual study and I find that it is with difficulty that a young infant can digest proteids. We must start with a very low percentage of proteid and go up gradually with this most important element in the infant's diet. If an infant cannot digest cow's milk (no matter what its modification) and we are compelled to make use of a proprietary food, I generally use glaxo. This food is a dried milk and it can be made to resemble mother's milk by the addition of water. However, the gain in weight is not rapid.

4. *Infant feeding in summer diarrhœas*. Dr. H. B. Cushing.

The artificial feeding of an infant is apt to be a difficult problem under the best of circumstances, as we all know to our sorrow. With a normal healthy infant one has at least a good prospect of succeeding, but during the hot weather, and when the case is complicated with an entero-colitis, the difficulties are increased ten-fold.

During the past few summers it has been my privilege (or misfortune) to be in charge each year of the wards of two or more institutions receiving young infants under their care, and so I have had rather unusual opportunities of observing the end-results, so to speak, of the artificial feeding of infants. The usual sequence of events has been that the child was nursed for a few weeks or months, then started on a course of artificial feeding, usually passing through a whole series of modified milk mixtures, whey and cream, and proprietary foods, until hot weather and summer diarrhœa intervened, when the victim was sent into an institution as a last resort. I cannot say that the results of my treatment of these cases have been so remarkably successful that I wish to lay claim to any original or infallible method of treatment and feeding, but since I have been asked to speak on the subject this evening, I will briefly outline the general principles which I have adopted.

The first question is naturally that of prophylaxis. I am sure it will not be out of place if I spend a few minutes in speaking of infant feeding from this standpoint. Personally I am profoundly convinced that the ordinary summer diarrhœa is an infectious disease with a seasonal prevalence. In the institutions with which I have been connected it has been my experience to observe repeatedly that the cases in the wards would be getting along fairly well, even through spells of very hot weather, until, following the advent of some acute case of entero-colitis to the ward, there would be a sudden outbreak of cases of summer diarrhœa with the usual mortality.

The conclusions I reached as to prophylaxis were:

First, that acute cases of summer diarrhœa should be as far as possible isolated and not received into homes or hospital wards with other children of susceptible age.

Second that, since the infection is obviously through the alimentary tract, sterilized or pasteurized food should be used during the very hot season in all densely populated places. If the milk supply cannot be relied on during this time, it is better to use condensed milk or prepared foods, with all their disadvantages, than expose the children to the serious danger of infection from contaminated milk.

Third, when the weather is very hot it must be remembered that the infant is unable to assimilate the same quantity or concentration of nourishment as in the colder weather; in other words, that the maximum tolerance of the child for food is greatly diminished. Therefore the total quantity of food should be diminished or the dilution increased to prevent gastro-intestinal disturbance that would predispose to infection.

The next question I have to consider is the diet during an acute attack of summer diarrhœa. This is one of the few points in infant feeding that everyone seems agreed on,—the diet during the acute stage is one of starvation. The less food we give the child for a short period the better for the child. The best diet for the first day or two is plain boiled water. It is often difficult to carry this out and the usual method is to give some bland non-irritating fluid which serves the same purpose. Dilute barley water, rice water and oatmeal water are familiar examples. In Vienna it was customary to use weak tea without sugar in all these cases. Whey and albumen water which are much used for the same purpose have been objected to by some authorities from the theoretical standpoint that they are proteid solutions and so subject to decomposition in the bowel with the development of toxines.

The first question that arises is how long should this starvation diet be kept up. Cases differ and the only rule I can suggest is that it is usually kept up for too short a time to accomplish its real aim, and that it is better to continue starvation for a little longer than is thought absolutely necessary.

The second important point during the acute stage is to endeavour to maintain or increase the amount of fluid in the body, to lessen hydration and intoxication. The most satisfactory and efficacious avenue of absorption of fluid is the natural one through the stomach and intestine. However, if the child cannot or will not drink, the next best method is by the rectum. I have long considered that the important point in rectal lavage in summer diarrhœa is not the amount of material removed, but the amount of fluid retained, and for this reason have come to use only weak saline or sodium bicarbonate solutions abandoning all astringents and antiseptics. The fallacy of so-called high rectal enemata is generally admitted. Anyone who has watched the entrance of bismuth solution into the colon with the fluoroscope recognizes that any fluid introduced slowly within the internal anal splincter reaches the ileo-cæcal valve in a few moments if retained in sufficient amount. I have tried the drop method of continuous rectal saline administration but never had much success in young infants. Rectal methods failing, the subcutaneous and intravenous methods have been recently advocated, with some success in desperate cases.

The question of feeding an infant during the later stages and convalescence from an attack of summer diarrhœa presents the greatest difficulties of all. It is here that we find the widest divergence of views among authorities. If appears to me that the most important point of all is to realize that the infant's ability to digest and assimilate food is seriously impaired and remains so for a considerable time. In other words that it is necessary to go slowly; that the error is most likely to be made on the side of giving too much food, or too strong food, and giving it too early. Especially is this the case where there are signs of definite organic change in the mucosa, catarrhal or ulcerative; in other words where mucus and blood occur in the stools. In these cases it is important that the parents should be warned that it will be weeks before a return to the regular diet is possible, or the child can be expected to gain weight as before the attack. Modern ideas of high-caloric feeding in fevers do not seem applicable to babies, at least clinically.

As to the character of the food to be given during convalescence, there appear to be as many views as there are writers. Each of the three main elements, fats, carbohydrates, and proteids has been blamed in turn for causing the difficulties and we are cautioned by different schools to avoid each of the three. Individual cases undoubtedly differ, and the main point in my experience is to go slowly, and increase gradually. The chief danger is trying to advance too rapidly and give more food than the child can properly assimilate.

Discussion. Dr. A. D. Blackader: The papers presented tonight have all been interesting, and taken together are an able presentation of the important facts in infant feeding. The first paper is, however, in my opinion, a too enthusiastic presentation of one method; a method which has its value, under certain circumstances, but one which, even in Boston where it originated, is not now regarded as generally very successful. In a letter received only a few days ago Dr. Lovett Morse, now the professor of pediatrics at Harvard Medical School and a pediatrist who has had a long experience in milk dispensaries and infant hospitals, writes as follows: "I do not use whey mixtures as a routine; I may start very young babies on such a mixture, but as soon as possible place them on a milk formula." Dr. Holt, of New York, also writes me: "I have no great confidence in whey and cream mixtures in troublesome cases. There are healthy infants who will do well on many various formulæ, but personally I have not used whey and cream in difficult cases for three or four years. I do not think the results of such mixtures have as a rule proved satisfactory." Dr. J. Crozer Griffiths, of Philadelphia, has also written me to the same effect, namely, that he only occasionally uses whey and cream mixtures as they have not given him the satisfaction which was at first expected from them. My own experience agrees with the statements of these men. Excellent results are occasionally obtained, but the general development of the infant does not proceed so satisfactorily, as it does on a suitable milk modification.

In answer to the question how we can judge as to whether a food is agreeing with an infant, I would add one or two more tests to those given by Dr. Fry. Not only should the food be digested readily and perfectly, as shown by freedom of the infant from colic and by a daily normal stool, but the child also should gain in weight regularly, develop normally, and sleep peacefully, and its skin should be free from signs of irritation. Lack of sleep is frequently an indication of imperfect nutrition due to a deficiency in its food of nutritive elements; rashes on the skin are often an indication of some fault in the dietary; not infrequently there is an excess of the sugar or fat elements.

In the feeding of an infant there are a few fundamental facts besides those mentioned this evening, which must always be borne in mind. The first is the great demands that the infant makes on its stomach to supply sufficient nutrition for growth as well as for wear and tear. An adult stomach has to supply nutrition simply to make good the daily loss; an infant's stomach has also to do work to permit growth going on regularly. Hence an early important sign of defective nutrition is the ceasing of an infant to gain in weight This is one of the important tests always to be applied in the feeding of every infant. The infant should be weighed carefully every week and its weight recorded. An excess of carbohydrates or of the fats in the dietary may cause a very rapid gain in weight; a too rapid gain is often followed by a sudden loss. A frequent cause of failure to gain in weight is imperfect absorption and assimilation of food due to faulty digestion, either of the milk as a whole or of one of the individual elements of it; of the protein, the fat, or the sugar. Often the faulty digestion of one of these elements leads to the imperfect digestion of all. With any sign of indigestion or with any failure to gain in weight careful attention should be given to the examination of the fæces, as in this way an estimate may be made as to how completely the digestion of the several elements of the food is going on. Physicians should be on the alert to detect the beginning of trouble. I think Finkelstein is correct when he calls attention to the condition in which this imperfect digestion of one of the elements of the food has been allowed to persist until the child acquires a distinct intolerance for that element, or a "food injury" as he terms it. When this condition sets in it is necessary to exclude from or greatly lessen the amount of that article of food in the dietary for some time, and only slowly resume its administration. A failure to gain in weight is one of the early symptoms of the development of this condition.

Now what is the most frequent cause of indigestion? Speaking broadly, I should say excess either in the food as a whole, or in one of the elemental ingredients. This excess may be found either in the amount given at a time, or in its too frequent repetition. Dr. Evans has called attention to the great advantage of lengthening the intervals between the feedings to three and afterwards four hours, thus securing a definite rest for the stomach after it has accomplished its task of digesting the previous meal. Infants differ greatly in their capacity for digesting food; some appear to to have so much vitality that they digest without trouble what might appear to the scientific physician to be an indigestible food; others are very sensitive to the slightest overstrain. It is always to be remembered that a weak digestion may be strengthened by an abundance of fresh air, a freedom from too much nervous excitement and the securing of sufficient rest for the stomach between the times of feeding.

In the case of a weak digestion in a delicate infant, it is often a very difficult problem to arrange a food that will prove satisfactory. Occasionally we may have recourse to the whey and cream mixture, as suggested by Dr. Fry; more frequently I try to modify still further either the whole milk or top milk, and so render it suitable to the digestion of the individual infant, altering the amount of the protein or the fat, or the sugar, until I reach a digestible formula; then as rapidly as possible I strengthen it. The proteid is in many cases difficult of digestion and its percentage must be reduced. Not infrequently, however, the cause of the proteid indigestion will be found to be an excess either in the fat, or in the carbohydrate. It is always desirable to try to maintain the the proteid element as high as 1·5 per cent. or 2 per cent. in the food. The young of all animals whose food contains a moderately high percentage of protein develop better and more strongly than do those in whom the percentage is low.

The digestibility of the proteid may be increased by the addition of one grain of sodium citrate to the ounce of milk converting the calcium caseinogenate into the less coagulable sodium caseinogenate. The tendency to form hard curds also may be lessened by the use of a cereal gruel instead of water.

The fat in the food is the element most liable to give trouble. Any indigestible excess of it promptly induces vomiting, and diarrhœa. As a rule 2 per cent. is as much as many infants can deal with at first; this amount may be gradually increased to three; very seldom can we increase beyond 3 per cent. without setting up symptoms of indigestion and often signs of acidosis, manifested by ammoniacal urine, vomiting and diarrhœa. In some infants we meet with quite a marked intolerance to fat. This in my experience is often the case with infants suffering from tubercular infection. In all cases on the other hand where the fat content of the food has to be lowered below 2 per cent. there is a tendency to the development of rachitis, and care must be taken to maintain the proteid element in these cases as high as may be practicable.

Sugars are as a rule more easily digested than are the fats, but excess in them, if persisted with, may do definite harm. Finklestein has emphasized the danger of such excess giving rise to a definite intoxication associated with a watery acid irritating diarrhœa quickly producing an erythema of the nates. Pediatrists in this country question some of his statements. Nevertheless, most of us are convinced that one of the best ways of checking an irritating watery diarrhœa is to stop the fats and the sugars. Physicians often forget that a thick barley jelly contains about 2 per cent. of carbohydrate, a thin barley gruel about 1 per cent. Allowance must be made for this in our modifications, and the amount of lactose correspondingly diminished.

It is sometimes of service to substitute maltose for the lactose. Maltose is said to be more easily assimilated and less liable to cause fermentation, and appears to be specially useful in those cases where we have difficulty with the digestion of the fat. It may be substituted for the lactose, either only in part or entirely. In its digestion it splits up into mono-saccharides that are said to be more easily absorbed than is the case with milk or cane sugar.

In reference to the starches in an infant's food they are in my opinion often of much value in the form of gruels to prevent too rapid and consequently too firm coagulation of the caseinogen. Although not an ingredient of human milk, Shaw, of Albany, and others have proved that even very young infants will digest a small amount of starch, but if given in large amounts to infants under six months, it is apt to induce colic from its imperfect digestion and subsequent fermentation. Even very young infants may, however, occasionally make use of a little in their food with benefit.

In all cases of artificial feeding it is of great advantage, as Dr. Evans has stated, to have a good nurse who can soothe a nervous infant, and who appreciates the value of fresh air, cleanliness, quietness, and of regularity in all the infant's habits.

Dr. G. G. Campbell: With regard to the proprietary foods, I never make use of them unless forced to, but here in Montreal under the present conditions of milk supply we are frequently forced to use these foods in the hot summer months. We all start out with the ideals taught by our professors; that milk can be modified to suit the average infant, but when one cannot get clean, fresh milk during the hot months recourse is often had to these foods. In the summer time, faced with an indigestion which may be severe and take the form of diarrhœa, high temperature, mucus and blood in the stools, I feel that it is nearly always the milk that is at fault. In the summer it is delivered in such a way that it is not fresh when it gets to the home and there sterilizing it and keeping it sterile is difficult, and it would seem that the best thing one can do is to get rid of the milk altogether and use proprietary foods. These all have the defect of having too little fat and too much carbohydrate. If you keep them up for any considerable time the liability to rickets and scurvy is certainly present. It is a mistake, however, to say that children do not thrive on these foods; they seem to grow well and are exceedingly fat; but the fat is of a flabby nature and, they withstand illnesses very badly, and also lack colour.

With regard to the use of the whey and cream mixtures, or milk mixtures, I find that a frequent cause of failure in getting babies to thrive either on one or the other of these mixtures is that they are not persisted in long enough at a time. As a rule if at the end of two or three days things are not going right, the food is cast aside and some other formula tried; whereas if you stick to it, cutting it down probably, I think that before long a tolerance can be established and you can then gradually increase the strength. That is a point which is very often overlooked. Common sense is better than theory; and though milk mixtures may be theoretically correct, if they do not agree it is not common sense to keep them up indefinitely because they should agree. And if one makes a change, even if it does not seem to be the correct food, and the child gains weight and sleeps well, I do not care if it does regurgitate half it is given or even has a little diarrhœa.

Dr. D. P. Anderson: We are on a rather thorny question when it comes to infant feeding. It is said that a divergence of opinion is rather a healthy sign than otherwise. In regard to Dr. Fry's whey and cream mixture, while I would not go so far as Dr. Holt, I certainly think Dr. Fry has done a great deal of pioneer work. We do have to apply to the whey and cream mixtures when we get a child down to the last extreme, and we certainly must look upon it as our last resort in difficult cases. At the same time we have a decided lack in the lactalbumins and I think anything below 1 per cent. rather excludes the food as a good thriving food. Again there is the great difficulty in preparing it. One might think it was an easy matter to prepare it, yet we are not all blessed with this aid; it is a difficult matter to make it properly outside of a laboratory and most mothers could not do it. What is more, we have great difficulty in destroying the ferments. Unless it is treated to a certain temperature we rather precipitate everything and destroy the enzyme, or, do not eliminate the ferment. Dr. Fry's mixture goes down as low as 0·8 per cent in lactalbumins. I consider this mixture is a good institutional feeding. As a matter of fact in the home modification eight out of ten babies will thrive thoroughly on a simple mixture of whole milk, i.e., top milk, water, milk sugar and sodium citrate. I have found that the sodium citrate is rather unstable, and we have not been able to do much with it, though Burroughs and Wellcome have a very good preparation, one grain of which to the ounce of milk gives a very satisfactory food in general work.

In coming to the fact of the composition of these foods the quantities have to be taken into consideration. We have to consider the difference in the digestive power of cow's and human milk. Cow's milk takes fully three hours to digest while that of mother's takes one and a half hours to two hours. Besides that there should be a period of rest when the child throws out an amount of mucus into the stomach, and the time of feeding, therefore, should be rather lengthened than shortened.

As to the matter of fat it cannot be increased above 3 per cent. and the fats as used in cream mixtures are decidedly dangerous because we have such difficulty in getting fresh milk in hot weather. Most of these modifications, I think, have to begin with a very small percentage and gradually increase. As to the sugars, I think they are a dangerous element. They are subject to change. If you get your milk too cold you have a precipitation of the sugar; if it is too hot you have a fermentation, and one has to be very careful in the quantities and qualities of the sugars used. In regard to the use of maltose, I have tried that in quite a few cases and I do not find it uniformally successful, from the fact that it produces a certain amount of increased peristalsis and frequent bowel movements in some children. In regard to starches, I disagree with a great many in regard to this. It has been proved conclusively that children histologically and every other way have shown that they have decided starch digestion, that the salivary glands function from the earliest infancy—as much as 5 c.c. of salivary secretion has been demonstrated to have been swallowed with 100 c.c. of milk. The starches should be thoroughly cooked.

As to the proprietary foods a great many of them are very harmful and we get a great many cases of gastro-intestinal trouble, plus malnutrition from their use. They contain a large amount of maltose and they are very changeable. Even Robinson's patent barley which contains a certain amount of starch, on scientific examination has been shown by government analysis to alter greatly in the quantities and qualities of the carbohydrate elements.

Dr. D. H. Bernstein: In the modification of milk it may be possible for a trained nurse to follow elaborate directions for its preparation for infants, but few families can afford a trained nurse. The average mother has probably other children to look after, her numerous household duties have to be attended to and but little time can be given to the preparation of a food for one particular child; she therefore will look for something easy and cannot be blamed for failure to follow out complicated methods of preparing an infant's food. The medical man should consider the environment of the case in question. Many of these women have come to me with these complicated formulæ and asked for something easier and in many cases I have had to go back to the proprietary foods. I have used these foods at the Herzl Dispensary with very good results: to give an example. J. L., aged eleven weeks, a full term child, weighing six pounds; nursed for six weeks when mother had to go to hospital for operation for mastitis when he was placed in the Foundling Hospital on a modified milk diet. Four weeks in the institution when the mother brought the baby to me. It was now eleven weeks old, weighed six pounds (same as at birth) was cyanosed, fretful, skin in folds, like an old man, temperature 97°, pulse 110; three stools daily. I placed him on condensed milk, a teaspoonful to every three ounces of water every two hours. April 3rd, had gained one and a quarter pounds, temperature 97°; quantity increased to one and a half teaspoonfuls to four ounces of water. April 10th, eight and a quarter pounds, seemed quite happy. April 17th, eight and a half pounds; water increased to five ounces, same amount of condensed milk. April 24th, weighed nine and a half pounds, seven ounces. May 1st gained eight ounces, bowels regular. May 8th, ten pounds and two ounces; increased milk to two teaspoonfuls in five ounces of water. April 15th, weight ten pounds, three ounces, having gained but one ounce but was suffering from an attack of bronchitis. This case certainly did well on this proprietary food.

The reason why so many men fail with these foods is that they try to suit the baby to the food and not the food to the baby. During the last five years I have had annually about five thousand consultations involving many children and, in addition, during the last two years have treated at the Herzl Dispensary over three thousand cases. My experience has taught me to classify the infants so as to be able to judge the food most suitable for each individual case. My experience has been particularly with the following foods:

1. Condensed milk,
2. Horlick's malted milk,
3. Allenbury's foods (No. 1. and 2.),
4. Nestle's food,
5. Top milk with barley, rice or oatmeal water.

The cases I found suitable for condensed milk were, children over six weeks who were emaciated and had several stools daily; diarrhœa is no contra-indication. I did not find it suitable for babies under six weeks of age or if markedly constipated, and it is not advisable to use condensed milk during July and August.

Horlick's malted milk is suitable to children who have a tendency to constipation and whose nutrition is not much impaired. Allenbury's food is suitable for very young infants who must have artificial feeding from birth, but the transition from No. 1 to 2 must be gradual; I always mix the two foods for one or two weeks. Nestle's food is suitable when mixed feeding is required.

As to the preparation of these foods I always use a teaspoonful to three ounces of water and bring to the boiling point so as to destroy the ferments; condensed milk does not require boiling but is mixed with boiled water. For children over six months of age, I allow Zwieback or stale crusts which they chew.

Children over six months, or earlier in small families, get top milk diluted with a cereal water and cane sugar added, a tablespoonful to the pint. The cereal chosen depends on the state of the bowels; if there is a tendency to diarrhœa rice is used, if constipation, oatmeal, and where the bowels are regular barley is employed. These cases where I employ milk always give me a certain amount of anxiety, for 95 per cent. of my patients are of the poorer classes who cannot choose their milk supply nor have they the facilities for keeping the milk in good condition; even the milk from the milk stations will go sour in some of these homes in two or three hours. The problem before us in Montreal is to find a method of preparing a food in a simple way which will not deteriorate easily in poor surroundings; at present this can only be done with proprietary foods.

In the matter of rickets resulting from artificial feeding, the question of heredity has hardly ever cropped up, but I have often observed cases of rickets run in families. I recently saw a baby five weeks old who had mother's milk exclusively, in which rickets was quite marked. Indeed, some of the worst cases of rickets that we have seen at the dispensary are exclusively breast-fed.

Dr. N. Viner: I think it is a general rule for practitioners to advise mothers not to wean their babies during the summer months but rather to wait till the hot weather is over, even if it brings it to twelve or fourteen months. One interesting question is, we are frequently told by mothers that they cannot nurse their infants any longer; by what tests should we be guided in according with the mother's decision?

Dr. A. E. Vipond: I am glad to learn that the salivary glands are active in early life as Dr. Anderson has stated, for my part I did not think that they were active before the ninth or twelfth month; indeed my studies of nodes in general would lead me to believe that this is the case with all the nodes of the body in infants.

Dr. D. J. Evans: With regard to Dr. Cushing's paper I find it extremely interesting as it brings up many interesting points. Prophylaxis is what we want and it is in those children which are so difficult to feed that we need prophylaxis. When the hot spell comes for these young children I order parents to dilute the food one-third or one-half with plain boiled water, and this has worked very well in controlling diarrhœas. Some years ago I had a great many children under my care in the Day Nursery and I found I got very excellent results from the simple procedure of using diluted sulphurous acid, a teaspoonful to the quart of water, from which I made a lemonade sweetened with saccharine. This was placed in pitchers round about, and the children were allowed to drink as freely as they would; that summer we had practically no diarrhœa in that institution.

Dr. F. M. Fry: I think Dr. Blackader is under the impression that my whey mixture is the only food for a child I recommend and that I begin and end with that. I only begin with that and lead up to others; I vary the foods as quickly and as frequently as the child permits. I use gravity cream in all cases, the percentage being sixteen. These whey and cream mixtures are designed for difficult cases. As to the proprietary foods, like Dr. Vipond, I renounce them all. I think the only bright spot in our infant mortality is the good milk we now can get. We have one or two really good milks in Montreal, which are above standard, chemically speaking, which are not pasteurized much less sterilized, and above all things contain averages in July and August of from 4000 to 5000 germs per c.c. As to Dr. Viner's questions we realize that we have not covered all the ground in this subject nor attempted to do so. Weaning in the summer is out of the question; wean either in April or September. I believe in examining the breasts and milk of the mother to come to a conclusion as to her ability or not to nurse the child, and also to take a very broad consideration of all other points, especially the nutrition of the child. The great point is that I believe that four fifths of the mothers with a little care and two or three weeks effort could increase, retain or thicken the milk in the breasts by very simple measures. I cannot resist saying that Dr. Bernstein's test of a food for two months, though that food may agree, is no test unless the results be favourable six or twelve months after. In diarrhœas infection plays a great rôle. Hence I was glad Dr. Cushing referred to this. Finkelstein overlooks it all.

Dr. W. F. Hamilton: I have been greatly interested in this symposium and greatly instructed thereby. I have had suggested to me, while listening, the idea that the Programme Committee might take up the question of some papers on the "Mother" in connexion with infant feeding. Pediatrics is growing in importance; certainly it is increasing in interest and many more men are taking it up and the society may well take a keen interest in this important branch of medicine.

SOME interesting vehicles were recently on exhibition at Euston Station, London, among them being two ambulance trains constructed by the London and North Western Railway Company for use in France. The complete train measures 925·6 feet in length and consists of sixteen coaches, nine of which are ward coaches. Each coach will carry thirty-six cot cases in three tiers on either side. When the lower cot is used for sitting-up cases, the two upper ones can be folded back. At the rear of the train there is an additional coach containing eighteen cots for cases of infectious disease. Accommodation is provided for three medical officers, four nurses, and a personnel of twenty-eight. There is also a well-appointed pharmacy car, an office and a treatment room. Movable buckets are used for the disposal of excreta.

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DISABILITIES, INCLUDING INJURIES, CAUSED BY BULLETS, SHRAPNEL, HIGH EXPLOSIVES, ETC., AS ILLUSTRATED BY CASES EXAMINED BEFORE A MEDICAL BOARD AT CANADIAN HEADQUARTERS, SHORNCLIFFE, ENGLAND*

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THE institution in military organization known as a Medical Board consists of three members, a president and two colleagues. Two such boards were formed from the personnel of No. 4 General Hospital in June, 1915, and sat daily at Shorncliffe for some weeks. Their duties consisted in examining men who were or had been physically unfit either because of illness, or from injuries received in action. The greater number of the cases examined in this particular instance were men who had either been wounded or had been the victims of gas-poisoning at the front and who had sufficiently recovered to be able to present themselves before such a board for examination for the purpose of determining their physical condition. Men who had been rendered permanently unfit for further service by their injuries were recommended for discharge from the Force. If it was found that the man was not permanently unfit then we had to state if we considered him fit for home service or for "light duty". If a man were temporarily unfit for home service or light duty we were required to give our opinion as to the probable period which would elapse before he would be considered fit. In some instances a man might be quite unfit to go into action and yet be able to render valuable

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service in various positions in England, such as instructor, office-clerk, officer's servant, etc. For example, a man might be incapable of standing the strain of heavy marching but would be quite equal to the task of work as clerk in an orderly room.

The number of cases which came under our observation in eight weeks was 819. In addition to injuries received in action there were disabilities the result of flat foot, hernia, varicose veins, heart disease, pulmonary tuberculosis, epilepsy, etc. The following list of the 819 cases examined will give some idea of the type of disability we had to deal with in individual instances.

Classified List of Cases Examined by the Medical Boards

Non-Traumatic Conditions:	
Flat foot	43
Varicose veins of leg	17
Varicocele	9
Hæmorrhoids	17
Hernia	23
Heart disease	40
Tuberculosis, in the Lungs . . . 24 elsewhere . . . 10	34
Defective vision	23
Epilepsy	16
Gonorrhœal arthritis	2
Alcoholism	4
Syphilis	3
Insanity	3
Goitre	4
Lateral curvature of spine	4
Exposure to wet and cold:	
"Frost-bite"	6
Rheumatism and sciatica	22
Lungs and Pleura, affections of, other than tuberculosis	17
Gastritis, ulcer, etc	6
Pyorrhœa alveolaris	4
Malingering	1
General ill health due to a variety of causes, anæmia, nephritis, etc.	16
	314
"Gas" poisoning:	
No second disability	43
With nerve exhaustion	17
With wound elsewhere	36
	96
Traumatic Conditions:	
Traumatism due to accidents and *not* caused by bullets, shrapnel, etc.	
Fracture of long bones	9

Sprains and dislocations:		
Knee	13	
Ankle	6	
Hand, wrist	9	
Other joints	9—	—37
Injuries to head, concussion and scalp wounds		4
Cellulitis of extremities		14
		64

Traumatic Effect of High Explosives:	
Neurasthenia	61
Deafness	18
	79

Gunshot Wounds:

	Shrapnel	Bullet	Bullet or Shrapnel, not specified	
Head:				
Skull, scalp, jaws	14	11	..	
Loss of eye	..	4	22	
Face	..	4		
Neck	..	2	..	
Upper extremity:				
Shoulders	6	7	..	
Arm and forearm	6	30	..	
Hand and wrist	10	17	..	
Chest	2	6		
Abdomen	4	2	..	
Spine	3	4	..	
Lower extremity:				
Hip	3	..	..	
Thigh and leg	13	22	..	
Knee	4	6	..	
Foot	9	7	..	
No locality given	20	18	..	
General effects of shell fire	10	..	..	
	104	140	22	
Total				266

SUMMARY

Non-traumatic conditions		314
Traumatic effects of high explosives	79	
Traumatism due to accidents and not caused by bullets, shrapnel, etc	64	
"Gas" poisoning cases	96	
Gunshot wounds, bullets, shrapnel, etc	266	
		505
Grand total		819

It will be seen that the greater number were those of injuries received in action, of these a much larger number of injuries were received in some portion of the body above the waist than in the legs or abdomen. Unfortunately in the records which we have preserved the locality is not stated in all. These will be more carefully tabulated for statistical purposes when the records are finally disposed of in the statistical department of the War Office, but in the less detailed notes which have been kept here for our own purposes it is evident that injuries received in the trenches are more likely to be about the neck and upper extremities than elsewhere about the body. That is as one would expect especially as our observations are necessarily restrictd to cases of men who are not fatally injured and who have recovered sufficiently to be able to present themselves before a board.

We shall first speak of a class of disability which preëxisted in minor degree at the time of enlistment and which had been aggravated by the conditions of active service with the result that the man was rendered more or less permanently unfit for further physical strain.

1. *Flat Foot:* This constituted by far the largest number in this series. In the vast majority of instances one found that men incapacitated by flat foot gave a history of trouble prior to enlistment. These men had the condition greatly exaggerated by heavy marching: they suffered pain and had frequently to drop out of the ranks when on route march. In many instances they were unable to stand without a considerable amount of pain. The condition varied in degree sometimes being of a very exaggerated type while at other times the arch was not entirely obliterated. One frequently hears the question discussed as to whether a man with marked valgus and free from pain should be permitted to enlist. In our present observations it is impossible to state the percentage of such cases which are able to continue their duties without discomfort, but unquestionably many of these men break down and become incapacitated. The conditions of active service are such as to increase the disability caused by flat foot. We would therefore argue that in recruiting such men should be rejected.

2. *Varicose Veins of the Leg:* Here again experience shows that such conditions are much aggravated by active service. Comparing the disability with that of flat foot it would appear that a larger percentage of cases were unaware of the existence of varicosities on enlistment. There have been a number of instances where extensive recurrence has occurred after operation and one is convinced that a

sufficient time is not allowed to elapse after operation before the man is allowed to go on duty. Unquestionably at least three months should pass after removal of varicose veins before a man is allowed to undertake heavy marching.

3 *Varicocele:* This condition does not produce anything like the degree of disability caused by flat foot or varicose veins of the leg and it is much easier to obtain radical relief by operation than in the case of the other two conditions. The fact that we have had nine instances of disability from this cause, however, shows that it is important to have the condition rectified before enlistment.

4. *Hæmorrhoids:* What we have said regarding varicocele applies in all particulars to piles. The degree of disability is often extreme. Pain and hæmorrhage are the chief complaints and the man is rendered absolutely unfit when these symptoms are exaggerated.

5. *Hernia:* As far as our experience goes no man was enlisted who was known to have a hernia at the time. Two classes of cases presented themselves, those who had developed a hernia for the first time in active service and those who suffered recurrence after operation. Men who have submitted to an operation are frequently allowed to undertake military duties far too soon. At least three months should elapse after radical cure before a man is permitted to undertake the strain of active service. Indeed it is a question whether such a man is fit for the strain of duties entailed upon him in the firing line, even if a successful radical cure has been accomplished. Unquestionably men who have suffered a recurrence are permanently unfit for service at the front.

6. *Heart Disease:* A number of heart cases have been examined. Some of these are recent cases and have undoubtedly developed during active service, some men giving a history of rheumatism following exposure. Others dated their trouble to a period prior to enlistment. We were compelled to discharge a number who were obviously unfit, but occasionally the heart lesion had been discovered accidentally by the regimental medical officer in cases in which there was perfect compensation. Such cases we considered should not be subjected to the strain of active service at the front but were recommended for less arduous work.

7. *Tuberculosis:* This was manifested in various lesions of lungs, glands and joints. Men on active service are necessarily exposed to wet and cold and at times it may be impossible to obtain shelter from bad weather for hours or days together. Under these circumstances it is not surprising that there is a danger of pulmonary

tuberculosis developing in those who are predisposed thereto. In a large percentage of the cases examined it was obvious that an active condition had been engrafted upon a healed lesion or the physical signs showed an old quiescent lesion in one lung with acute trouble in the other. It is therefore obvious that the recruiting Medical Officer should be careful to refuse to pass men as physically fit who have a known predisposition to tuberculosis or who present evidence of having previously had tuberculosis of the lungs. We encountered very few cases of cervical tuberculous glands and a still smaller number of tuberculous joint disease, but in two instances an old healed lesion in the spine, with slight kyphosis in each case was found. The trouble had undoubtedly been quiescent for years but had apparently become active as a result of the exacting and strenuous life of active service.

8. *Defective Vision: Deafness:* Several men had been found unfit for duty because of defective vision chiefly myopia and astigmatism. Most of these had a high degree of myopia, in one eye only, the result in most instances of a slight strabismus. Such men are incapacitated for shooting and must therefore be considered unfit to go into action. Deafness is obviously a great handicap to a soldier and where at all marked the man is absolutely unfit for service. One man was very deaf and told us he was unable to hear the words of command.

9. There were other conditions such as epilepsy, chronic alcoholism and lateral curvature of the spine of which we had examples. One man had a most exaggerated degree of lateral curvature with fixed deformity rendering him absolutely unfit for duty. The epileptic is obviously unable to serve at the front. He is a source of danger to his comrades and at any moment may become quite incapable of looking after himself.

A study of all these conditions emphasizes the importance of adhering absolutely to army regulations in the recruiting office. Many of the conditions enumerated in the above list are examples of the failure to comply with these regulations on the part of the medical examiner at the time of enlistment. We note these conditions in order to urge that more care should be exercised in this particular. Men who are thus physically unfit and who are permitted to enlist have a miserable existence for weeks or months until finally they are compelled to relinquish the effort to continue their duties. Few of these men ever reach the front, they are a source of expense to the country and have served no useful function. Many of them have done themselves permanent injury in the attempt. It is therefore obvious that in the interest of the individual and of the country he seeks to serve, such cases should be rejected at the recruiting office.

We shall now proceed to deal with disability arising primarily as the result of injuries received while in action.

1. *Gas Poisoning:* There were ninety-six cases before us. We saw no recent cases. With, I think, no exception, they were men who had been poisoned at Ypres on the 23rd or 25th of April, i.e., three months after having been subjected to the fumes. As far as our observation goes it would seem that while the Germans inflicted serious damage on our troops during those few days in the latter part of April, they never succeeded again in their diabolical effort to gain ground by this contemptible method of poisoning men. Prompt measures were taken to protect our men against the influence of gas and these efforts seem to have been wholly successful so that it seems certain that no further injury will be caused by such means. It is true that some cases of short exposure to the influence of gas have occurred since April but the effects of these have been very evanescent. Regarding the more serious effects of gas we learn that not a few cases proved fatal soon after exposure or within the first few days. In our board work we had to deal with many cases of serious poisoning who had passed the initial danger but were still suffering from symptoms more or less distressing. Shortness of breath was complained of on exertion, or, at times, coming on apart from exertion, the man occasionally waking at night with dyspnœa. These men usually complained also of excessive secretion with expectoration particularly in the morning. The physical signs on examining the chest were practically negative and it was remarkable that one was never able to detect by this means any serious lesion in the lung. Next in order came marked gastric irritability, evidenced by the fact that the man was unable to retain any solid food. Many of these cases were able to take milk and soups but the moment they took solid food of any description they vomited. Occasionally we were told that the man would vomit in the morning only, this occurring immediately upon his first meal for the day, no matter what type of food was taken, but that he had no trouble with dinner or supper provided he took fluids. Over a period of weeks in many cases there had been no improvement. We also got a history in several instances of hæmorrhage from the bowel with diarrhœa and hæmaturia in the early stages.

The problem which thus far we are unable to solve is whether or not the damage done to the gastro-intestinal tract or to the respiratory organs is permanent. These men continue to have symptoms three months after the exposure to the gas, and occasionally with little or no tendency to improve. We have no previous experience of such cases to go upon and we are therefore quite unable to determine whether the damage done is permanent or not.

The cases of gas poisoning frequently were victims of other injuries, suffering possibly from nervous shock or from wounds.

2. *Exposure to Cold and Wet in the Trenches:* This as we have seen was sometimes the cause of lighting up a latent pulmonary tuberculosis or again it induced rheumatism, sciatica, etc. Frost bite of the feet was observed in a number of instances: the exact nature of this is not quite evident. The men in cold weather were standing in water, wearing boots and putties, the feet and legs were soaked. This as we know from reports from the front sometimes induced extensive gangrene resulting in the loss of the foot or leg. We saw the minor effects in those who had recovered after a superficial ulceration such as would result from frost bite and often the characteristic painful and congested cicatrix was producing marked disability.

3. *Nervous Shock:* Men exposed in the trenches to heavy shell fire are inevitably exposed to nerve strain and the effect produced varies within wide limitations. Occasionally there is a somewhat sudden and complete breakdown with results which continue for months. At other times a man may come through all this nervous strain and possibly receive serious wounds without any appreciable collapse of this nature. Some men who suffered in a severe degree appear to be complete wrecks. They are usually very emotional and may break down as they are telling their experiences. Tremor is always a characteristic symptom. The heart's action is rapid, the pulse being from 100 to 120 per minute. The knee jerks are markedly exaggerated—insomnia, anorexia and a constant feeling of fatigue are common. The man is wholly unfit for sustained effort of any kind, his memory is frequently defective and he is obviously worried and apprehensive. These men should have every consideration and should be provided with a suitable environment to ensure recovery. A period of months must elapse before a man who has severe symptoms is fit to assume duty again and occasionally years may elapse before recovery. It is therefore difficult to arrive at a conclusion in endeavouring to predict how soon the individual case will be physically fit for duty. We are told by

those at the front that the tendency is to send these men into action too soon, the result being a second breakdown under much less strain than the first. Our impression is that many cases of the exaggerated type will never be fit for active service during the present war.

4. *Head Injuries:* (*a*) *Injuries to Special Senses: Vision* was *impaired* by various types of injury. There were twenty-six cases of loss of one eye, in most instances enucleation had to be performed subsequent to the injury because of the extensive damage which had been inflicted. Then again injuries by bullets or shrapnel in the neighbourhood of the eyeball not infrequently resulted in separation of the retina or hæmorrhages causing permanent impairment of vision. *Deafness:* This results from the effect of high explosives, the drum may be perforated and resulting otitis media may cause serious trouble. The auditory nerve is also affected in many instances and thus permanent damage may be done. *Affections of Speech:* This gives us some most interesting conditions, of which perhaps *stammering* is the most remarkable. For example, a man of twenty-two was in the trenches when a shell knocked a portion of the parapet over on top of him. He was buried under debris and rendered unconscious. He waked up some two days afterwards in the hospital at Rouen. He had a flesh wound of the right leg caused by shrapnel but this healed readily. When seen by us two months after the injury his mentality was perfect, he could read and understand readily all that was said to him but he had largely lost the power of continuous articulate speech. His effort to say "Yes" in reply to a question, for example, would be accompanied by irregular contraction of various muscles. He jerks his head spasmodically, his arms twitch and he slaps his thigh until at last he succeeds in pronouncing the word which comes out in a final spasmodic fashion. If it is a sentence, after he manages to pronounce the first word the whole sentence comes rapidly one word succeeding the other with great speed. The difficulty seems to be in getting the initial word. It would seem as if when the motor centre for speech is stimulated there were an overflow of stimuli to the centres controlling movements of the head, neck and arms resulting in irregular muscular contraction. Numerous instances of less marked stammering were observed from similar injuries and one learns on inquiry that it is quite a common occurrence as the result of injuries in action. In the cases observed it is obvious that improvement takes place slowly but the prospect of final complete recovery is good.

Fracture of the Skull: We had a few examples of this but, judging from our experience, it would seem that practically all cases in which a bullet perforates the cranium and brain result fatally.

Fracture of the Jaws: This is not uncommon and we have had numerous instances both by bullet and shrapnel. A few cases may be quoted to illustrate some narrow escapes. A man of twenty-two was struck by a bullet on the left nasal bone; it passed to the right, downwards and slightly backwards and made its exit through the right malar bone. It severed the right infraorbital nerve and caused ectropion of the right lower eyelid. The explosive effect of the bullet caused permanent damage to the retina with loss of sight of the right eye. In another man a bullet entered below the anterior portion of the zygoma on the left side and traversing the facial bones made its exit on the right side of the face at a slightly lower level. The only damage persisting seemed to be some narrowing of the right nasal passage requiring a slight operation for his relief. One man presented himself with a scar below the middle of the left zygoma; he produced a circular piece of metal 1 inch in diameter and $\frac{1}{4}$ inch thick possessing a screw thread on its edge. This had been found in the wound by x-ray and removed by operation. The circular piece of metal was no other than the cap on the top of a shrapnel shell. The only disability this man suffered was inability completely to open his jaws.

Scalp Wounds: Flesh wounds from either bullets or shrapnel were of common occurrence among the men who came before us and not a few of these were in the scalp. In one case the soldier had twice narrowly escaped serious injury. He had two longitudinal scars on the top of his head, each was about three inches in length and they ran parallel to one another. One was caused by a bullet in April. The wound healed readily and on his return to the trenches he received the second scalp wound from shrapnel. Another case was that of a man who received a bayonet wound in the forehead. He was a lad of twenty-one who told an interesting tale. He stated that a German attempted to bayonet him but he knocked his rifle up and so received a glancing cut from the bayonet on his forehead. He then hit the German a blow on the chin with the butt of his rifle and the enemy started to run away. He then drove his bayonet into the man's buttock up to the hilt and was unable to pull it out. Blood from the wound in his forehead now trickled down over his eyes and blinded him so that he had to be carried back to the dressing station.

5. *Concussion of the Spinal Cord:* Several men gave a history

which could only be explained by this type of injury. A man received a severe blow on the back from shrapnel causing immediate paraplegia. The paralysis lasted three or four weeks after which he completely recovered the use of his limbs but continued to suffer from nervous shock. Another case with a similar history was in the trenches when a shell burst and upset a number of sandbags on the parapet. These in falling struck the man in the back. He was knocked down and buried under the sandbags and immediately became paraplegic. This cleared up in a short time.

6. *Injuries to the Lungs:* We saw no cases of extensive laceration of the lungs such as would be caused by shrapnel; no doubt most if not all such cases prove fatal, but we encountered several instances of penetration of the lungs by bullets with recovery. We may cite two cases where the bullet must have traversed a considerable portion of lung tissue. Penetration of the right lung occurred in a man twenty-eight years of age. The bullet entered 1 inch below the outer end of the right clavicle; it passed downwards, backwards and inwards and made its exit at a point 2 inches to the right of the middle line where there is a vertical scar 2 inches long opposite the ninth and tenth dorsal spines. When we examined him two and a half months after the injury he complained of pain radiating along the ninth intercostal nerve towards the middle line in front. The ninth rib was fractured posteriorily. He coughed up large quantities of blood immediately after the injury but he made a complete recovery. Another remarkable case was that of a man of twenty-seven who was injured at St. Julien on April 22nd. A bullet entered his back at a point 3 inches to the left of the middle line above the tenth rib. It came out 1 inch external and 2 inches below the left nipple. He immediately spat blood in such quantity that he almost suffocated. He never lost consciousness but his companions were sure he was dying and being a Catholic the last rites were administered and his wound was not dressed. He survived, however, and was removed to the dressing station. He now presents himself in excellent health. He is a piper and he says he cannot blow the pipes at present because it causes him some pain in the left chest. On examining the scar in the front of the chest it is observed to pulsate, as the apex beat of the heart is immediately behind it. It is obvious that the bullet had passed in immediate proximity to the heart.

We are told that these cases of penetrating wounds of the lung usually develop a hæmothorax but no evidence was present, in those cases examined which suggested it, that there had been blood in the pleural cavity.

There were some cases of hæmorrhage from the lungs following severe crush without any penetrating wound. Thus a man of the Princess Patricia's Battalion was buried under portions of the parapet which had been driven in upon him by a bursting shell. He was buried under the debris for twenty minutes and he at once coughed up blood in considerable quantities. The bleeding ceased but he had a second very severe hæmorrhage. The physical signs showed some evidence of a fibrosed condition of the right apex and possibly an old healed tuberculous lesion had predisposed to the hæmorrhage.

7. *Wounds of the Chest Wall:* Here, as elsewhere, flesh wounds were common. One case illustrating a remarkably narrow escape was that of a man aged twenty-two who was struck with a bullet on the front of the chest. He fortunately had a packet of letters in his right breast pocket. This contained a dozen letters and formed a pad an inch and a half thick. The bullet hit this packet and passing obliquely through it from right to left caused a wound which extended from the fifth right costal cartilage 2 inches from the sternum, upwards and to the left, terminating over the second left costal cartilage close to the costo-sternal articulation. In its passage the bullet grooved a furrow out by the sternum. The explosive effect of the bullet caused some laceration of the lung tissue beneath, as he spat blood freely for some hours after the injury.

8. *Injuries to the Abdomen:* Flesh wounds of the abdominal parieties were exceedingly common but we met with no case of penetration of the abdominal viscera. We are told from the front that these occur, and remarkable recoveries are said to take place after penetrating wounds of the intestines by bullets. On this series of 819 cases not a single example was found and if we judged from the great variety of injuries presented above we would be driven to the conclusion either that penetrating wounds of the abdomen are comparatively uncommon or that such wounds are much more frequently fatal than wounds elsewhere in the body.

Injuries of the Extremities: (*a*) *Flesh Wounds* are exceedingly common, often quite superficial and producing little or no disability. (*b*) *Injuries to Bone:* Here we found great variety of damage. In one remarkable case a bullet had passed clean through the lower end of the femur, making a hole in the bone but not breaking the continuity of the femoral shaft. A large amount of callus was produced in the healing process but the man recovered with little disability. Many instances of severe and comminuted fracture of the long bones were produced by shrapnel and bullet. The bones of the hand and less frequently of the foot were fractured, producing varying types of deformity and disability. (*c*) *Injuries to Blood Vessels:* There were no important blood vessels severed in the series of cases presented. (*d*) *Injuries to Peripheral Nerves:* These formed one of the most interesting groups of the series, especially in the upper extremity. It seemed remarkable how frequently the injury was restricted to an individual nerve. One may cite a few examples. A man received a bullet wound of the left axilla and presented himself before our board with marked disability caused by paralysis of the circumflex nerve. The left arm was markedly elevated by contraction of the trapezius, and adducted. The deltoid was completely atrophied and the man was absolutely unable to abduct the arm from the side. There was anæsthesia of the skin over the deltoid. The disability was of course extreme. It is questionable if much could be done for his relief as in all probability a considerable segment of the nerve had been destroyed. Another man had a bullet enter the left arm on the antero external portion about 3 inches above the elbow. It came out on the postero internal aspect 5 inches above the elbow. There was no history to indicate that any important blood vessel was injured but the median nerve was divided as indicated by the complete paralysis of the flexors supplied by it, the outer group of muscles of the thenar eminence and the loss of sensation over the portion of the palm and digits supplied by the median. There was one case where, obviously, there had been contusion of the ulnar nerve but the paralysis when we saw the man was not complete. A bullet entered just above the condyles on the inner side of the arm posteriorly and made its exit on the outer side. A flesh wound resulted and probably the bone was scraped. There was diminished sensation in the ring and little fingers, with hyperæsthesia above the wrist on the inner side of the forearm, marked weakness of the interossei and inner lumbricales and the short muscles of thumb and little finger but no complete paralysis. These cases of nerve injury are interesting and present difficulties in determining whether there is complete severance or merely contusion and raise the question as to the treatment which should be pursued as to operation or otherwise

Many instances of remarkable escapes from serious injury were noted. Thus a man aged twenty-four had a bullet wound through the left axilla. The bullet entered just below the left coracoid process in front and traversing the axilla made its exit posteriorly just behind the posterior axillary fold on a level with the sixth dorsal spinous process. There was absolutely no disability or damage of any important nerve or blood vessel. In the lower extremity a man had a bullet enter the outer side of the left thigh 2 inches below the great trochanter and, passing in front of the femur with a slight obliquity downwards, it made its exit on the inner side, it then entered the right thigh and continuing the same direction came out on the outer side of the right thigh. There was no important vessel or nerve damaged and the disability was negligible. There were numerous joint injuries with varying degrees of stiffness and disability. One interesting case was due to severe injury to the right knee joint with severance of the anterior crucial ligament. The man was walking in the trenches when a sand bag fell on his thigh and knee causing the injury. With slight force one could dislocate the tibia forwards and inwards. The disability was so great that he was considered unfit for further active service.

The object of these notes, which are much more extensive than the author originally intended, is to indicate the type of cases which come before a medical board and the important and responsible duties which are discharged by such an organization during active service.

It is announced that the Honourable Frank E. Hodgins, Justice of the Supreme Court of Ontario, has been appointed by the provincial government to enquire into the subject of medical education in the province. It will be remembered that, at the opening of the new General Hospital, Toronto, the late Sir James Whitney announced that a commission would be appointed in the near future to investigate the vexed question of medical education and to enquire into the claims made by members of various cults, who are constantly clamouring for legislation to give them recognized standing. The enquiry covers a large field and the report of the commission will be awaited with interest.

NON-MATERIALISM IN MEDICINE

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I WISH to draw your attention this evening to certain subjects intimately related to the theory, the teaching and the practice of medicine on which I believe that sufficient stress is at the present time not being laid. It is perfectly true that during the second half of the nineteenth century, owing to the successful study of biological problems by the methods characteristic of chemistry and physics, a school of thought arose in Europe—and most prominently in Germany—which claimed that it had eliminated from the concept "vitality" all factors which were not derivable from purely physical considerations. But the assertion that biologists and medical men are essentially materialistic in their outlook on life is by no means of recent origin. It was said long ago—*Tres medici, duo Athei.*

The study of medicine is an applied science—science or knowledge applied to the recognition, the prevention, or the cure of human disease.

Now I am not going to take you over the region of the arid controversies between men of science—pure or applied—and men whose main concerns were in the spheres of religion and of the mind, for those controversies date back almost to the beginning of the Christian era; but we may assert on surveying those controversies that, as a matter of fact, the greatest men of science—the leaders, the pioneers—have not been irreligious men. My learned friend, Professor Walsh, M.D., D.Sc., LL.D., of New York, has pointed out how many distinguished physicians of the middle ages were devout members of the Roman communion; but to come at once to modern times, we find as a matter of common knowledge that Newton, the prince of men of science, was a devout Christian; Stephen Hales was a clergyman, Dalton was a member of the Society of Friends; Faraday was a devout dissenter (a Glassite); Sir James Simpson was a truly religious man, Lord Lister an earnest

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member of the Society of Friends, and Lord Kelvin, as I have just been reading, was an eminently reverent Scottish Episcopalian. Most of the minds of the first order in science—including under that term the applied science of medicine—have not only not been atheists, they have been reverent, devout, religious men. But I have no intention of detaining you on the general topic of science and religion, I wish to come down to a subject of considerable importance to medical thought—the reality of consciousness, of the mind, being a cause of bodily activity.

Certainly it was one of the legitimate deductions from the line of thought of the German school of materialistic physiology to which I have alluded, that there could be no room for any mental activity as an effective cause.

Helmholtz, one of the most brilliant of this band which included DuBois Reymond, Ludwig and Brücke, was closely connected with the discovery of the great generalization as to the indestructibility of energy and the transmutation of energy. In arriving at this generalization, nervous energy, nervous activity, nerve-impulses were deliberately left out of account.

The transmutation of chemical (potential) energy of the assimilated food into the various kinetic forms of muscular movement, heat, etc., was found to be susceptible of such accurate, quantitative, calorimetric treatment that a balance-sheet was drawn up (as for instance by Rübner) showing that, statistically, nerve-energy did not enter into the problem at all.

The equation expressing the quantitative relationship between chemical energy, motion and heat was apparently satisfactory without taking into account any such process as the passage of nerve impulses, far less the storing up of neural energy and the paying of it out to maintain tissue tone. Nerve-energy even now finds no place in the academic text-books; it is all right as drawing-room physiology; but the term has hitherto been regarded as the property of quacks of all sorts, "electro-biologists" and the holders of certain apocryphal American medical degrees. But without at present pursuing the question as to whether nerve-energy should be or can be included in the energy equation of the living body, we have, we find, to establish the prior claim for nerve-energy to be regarded as a separate real existence at all. Some of us believe that the nervous system is dynamogenic, and if so, that mental states must be veritable causes or causal conditions.

Even before this problem is attacked there is one more fundamental still, the general relations of mind to matter.

We have on the one hand the metaphysicians who, holding that mental states are all that is real, yet deny that a mental state can ever act upon a bodily tissue, who hold that the relationship of these, whatever it is, is never one of cause and effect; and on the other hand we have the materialistic physiologists who know nothing of any specific kind of energy called neural, and utterly deny that consciousness is a real existence and therefore capable of being a cause in the same sense that matter is.

Somewhere between these extremes come ordinary thinkers who firmly believe that nerve energy is as real as any other kind of energy, and that states of mind are as really causes as any other existences to which that term is allowed. We always have spoken as though mind could act on body and body on mind; as though the emotion of shame did really accelerate the heart and dilate the blood vessels, as though the "idea" that a patient was to get well helped him to do so, that the notion that a man was incurable helped to depress the activity of the bodily tissues, and so on. It is to say the least of it unsatisfactory that the average intelligent physician should be found to be holding views on such important subjects as the relations of mind to matter and the reality of nerve energy which according to most philosophers are not only indefensible but absurd.

There are really three schools of thought in regard to the relationship between mind and matter:

1. That consciousness is an epiphenomenon or bye-product of cerebral activity, bearing to the activity of the brain the same relation that the whistle of the steam-engine bears to the working power of the machinery: Epiphenominalism, with which the name of Huxley is associated.

2. That the two sets of phenomena—mental and cerebral—run parallel courses; but that the psychical cannot "act on" the physical, cannot be the cause of any physical activity, nor can the physical act on the psychical (Parallelism).

3. The plain man's view, as it has been called, according to which mind acts on matter and matter on mind. (Interactionism.)

I suppose all medical men are interactionists without knowing it, just like Mons. Jourdain, in Molière's play, who had been speaking prose all his life without knowing it.

Now medical men seem eminently justified in thinking as they do. Is there not a growing science of psychotherapeutics? Do we not all believe in hypnotism as the influence of mental states over bodily? Do we not hear daily of auto-suggestion? The whole tendency of modern medicine is increasingly to recognise the importance of the psychical: "Personality is the only real thing in the Universe," says Dr. J. S. Haldane, of Oxford, in a recent course of lectures at University College, London, the home of a materialistic physiology. The dissociation of personalities; dual, triple and multiple personalities, are commonplaces of the psychological analysis of the present day. A conscious and a subconscious mind or subliminal self, an ego and an alter ego, are now accepted as almost beyond the realm of hypothesis. The subject of psychical research has engaged the attention of some of the most eminent men of science of this and the preceding century, *viz.*, Professor James, of Harvard, Sir William Crookes, Sir Oliver Lodge, Sir W. F. Barrett; other presidents of the Society for Psychical Research have been F. W. H. Myers, Professor Sidwick, the Right Honourable A. J. Balfour, Andrew Lang, and Professor Bergson of Paris.

It is, however, I repeat, very unsatisfactory to be told by the philosophers that these things are appearances only; that mind not only does not but *cannot* act on body, nor can the body act on mind, when all the time we see, apparently, both these interactions proceeding continually before us. And if we, the orthodox practitioners, are in this outer intellectual darkness, what must be the state philosophically of those persons known as "faith healers" and "Christian scientists", whose whole position is that the mind can profoundly affect the body even to the extent of dismissing the existence of bodily pain: these persons must be lost indeed.

While the gulf gets wider between the medical interactionists and the philosophical parallelists, a school of medical psychologists has arisen in Vienna under the leadership of Dr. Sigismund Freud which takes into consideration not only conscious but unconscious states as causal. By what is called psycho-analysis, Freud has discovered that many dreams and many cases of hysteria are produced by the emergence of some subconscious state into the conscious level—a subconscious state usually of a disagreeable kind that had on that account been suppressed.

According to Freud all our mental states have emotional colourings; those that are pleasant are fostered or retained, those that are unpleasant are suppressed or relegated to the subconscious realm. In conditions of relaxed attention, sleep, illness, fatigue, etc., the subconscious emerges into the conscious and there, as a real cause, is responsible for the imagery of dreams, the characteristics of hysteria, as well as all sorts of inadvertencies, mistakes, slips of the pen and tongue. A great deal of hysteria, according to

Freud, is the result of some one or more suppressed because disagreeable mental experiences working away in the subconscious realm, with results that are disastrous to the health of the central nervous system. One can readily see that here we are on ground common to psychology, ethics, religion and philosophy—certainly the region of the non-material in medicine; this is one of the latest findings of medical science; it is distinctly non-materialistic, and it recognizes the psychic as casual. There is a good article on Freud in the *University Magazine* for April, 1915.

The physician should be more than ever versed in psychology, not only to comprehend the phenomena of undoubted insanity, but in order intelligently and effectively to apply the methods of psychotherapeutics which, although caricatured by "cranks", are based on vital and important truths. In exactly the same category stands hypnotism, a valuable therapeutic condition if rightly employed in suitable cases. "Personal magnetism," the influence of the physician's character, has no meaning if the mental is not causal.

I have no desire to add a single subject to the already large number in the medical curriculum, but I do think that between the physiologist, the professor of medicine and the lecturer on insanity, some instruction might be given on the influence of mind on body and body on mind. It is because I believe that this instruction should be given, that I think it unfortunate I should have to tell my students that many psychologists hold there is not, and there cannot be, any such interaction whatever. This tends to mental confusion. For a much fuller examination of this subject I can refer you to my article, "Consciousness as a Cause of Neural Activity" in the *Hibbert Journal* for January, 1913.

The subject of the causality or non-causality of the mental or the non-material is so important that we must examine it from as many points of view as possible. Luckily some of these methods are experimental; there is, as you know, an increasing demand for evidence which is not introspective but objective in character.

The first case is known as Sherrington's dog, an animal which had its neuraxis cut in the high cervical region when it was nine months old. It was noticed, when it had grown up, that it showed quite a conspicuous amount of emotion, just like a normal dog, the expression of the emotion, anger, for instance, being of course restricted to the regions of the head and neck. The interest of this case is that it disproves a view of the origin of emotion put forward by the late Professor James of Harvard. James' view was that emotion was not primarily a mental state but a bodily—that is to say, a person felt the emotion of shame because his blood-vessels were dilated, his blood-vessels were not dilated because he experienced the emotion of shame. James regarded emotion as due to a reverberation into the mind from certain altered states of the periphery; whereas, of course, the prevailing view is that emotion is primarily a mental state which, through the cerebrum, acts on tissues at the periphery and alters them so as to express the emotion.

On the orthodox view the mind is causal, on James' view the periphery is causal. James' view is an interactional one, but of this kind, that body influences mind, whereas the usual view in the case of emotion is that mind influences body.

Now Sherrington's dog upholds the old as against the new view. If the periphery were causal as the source of emotion, this dog ought to have had little or no emotion since so very large an area of its periphery was severed from all connexion with its brain. The dog had very little intact periphery from which there could be emotional reverberation. But it seems to have had as much emotion as an ordinary dog, although it had only its head and neck whereby to express it. Prof. Sherrington, after a long study of the animal, was quite convinced that its emotional behaviour, so far from being minimal, as is required by James' theory, was quite normal. If its emotion was not peripherally originated, it must have been centrally originated which is the usual view. The essence of this view is that the mental states are causes of bodily changes, such as dilatation of vessels, altered heart-beat, vomiting, peristalsis, and so forth.

Sherrington was convinced that the dog's emotions were not causally dependent on the contemporaneous conditions of its visceral or other periphery. To hold that they are the result of *memories* of visceral and other bodily states is to admit, in another form, the causality of the mental. James had put the cart before the horse; but he was half an interactionist all the same.

We cannot hold one half of interactionism and not the other. If the emotions can influence the body, the body can certainly influence the emotions. Because a child is happy its vessels are flushed with blood; because its skin is flushed with blood it feels comfortable and warm; because it is afraid of something it blanches; because its skin is cold it is uncomfortable. A strong, disagreeable emotion can give one an attack of indigestion, and an attack of indigestion makes one feel very miserable. Interaction between mind and body is reciprocal. If emotion is not causal, then psychic shock is an unreality, whereas we know it is a dreaded fact.

The next experimental contribution to the causality of emotion is due to Professor Pavlow of Petrograd. Pavlow, as is well known, studied the physiology of gastric juice in dogs with certain fistulæ and with an ingenious device called "the miniature stomach." Having established the fact that the paths for glandulo-motor impulses were by the vagi nerves, Pavlow early found that the dog's emotions had almost everything to do with the secretion or not of its gastric juice.

The following experience is worthy your careful consideration: A hungry dog sees the attendant approaching with some food; after the usual and peculiarly long latent period, the juice flows; on a second occasion as the attendant appears with the food the juice begins to flow as before, but now if the attendant turns round and walks off with the meat, the juice stops being secreted. These phenomena can be repeated over and over again. Here, it seems to me, we have as good a case for the causality of emotion as we are likely to get, for we have a case of J. S. Mill's "Methods of Difference" in Logic.

If A is always followed by B (A—> +B), and also if when A is absent, B is also absent (—A—>—B), then, Mill says, we may assume that A is the cause of B.

This is a logical method of universal validity; but just because the antecedent is a mental state and the subsequent a bodily state, the parallelists deny that the former is the cause of the latter, for they have previously asserted that the mental cannot be the cause of a change in matter. This seems to me scientifically dishonest. Because I do not comprehend the method whereby A is a cause of B—the how of it all,—I am not at liberty therefore to deny the applicability of the logical method of difference to this particular case.

We do not know *how* the pull of the moon on the waters of the earth is the cause of the tides, but no man of science has the slightest doubt that it is. I am perfectly aware that the same line of argument applies to volition, for instance: I will to move my hand and it moves, I will not to move my hand and it does not move. I have, however, purposely not used this case, as it is an old argument, and the very *bete noir* of the parallelists. I have thought it better to appeal to modern laboratory evidence on which so much stress is rightly laid nowadays; and something new has a force that something older does not possess; in science as well as in that other sphere, there is efficacy in "the expulsive power of a new affection."

Pavlow virtually established that gastric juice flowed in consequence of a psycho-motor (glandulo-motor) reflex action. But this is exactly what Dr. Beaumont believed nearly a century earlier in consequence of his studies on the fistulous stomach of the young Canadian, Alexis St. Martin. The language Pavlow uses is of course not Beaumont's, but it describes exactly what Beaumont discovered. He distinctly stated that when St. Martin was hungry and in good humour the juice flowed, when he was angry (and he was a very irrascible man) the juice ceased flowing, there was in fact the emotional inhibition of the glandulo-motor reflex action. No attention whatever was paid to this observation; and during the whole of the 19th century the teaching was that the mechanical presence of food in the stomach was the cause of a reflex (excito-glandular) flow of gastric juice. When Pavlow came to examine this statement he found that it was entirely erroneous. The mere presence of food in the stomach did not give rise to a flow of juice.

Pavlow distinctly proved that food in the stomach, when unaccompanied by the *knowledge* of its presence, did *not* cause the secretion of juice. If he slipped food into a gastric fistula when the dog did not notice it, no juice flowed; further if he slipped food into the stomach while the dog was sleeping, no juice flowed. In other words, a definite mental state needed to coexist with the presence of food in the stomach else the juice did not flow; the food itself was not causal nor even chiefly causal; the cause was a psychic state, the knowledge that food was to be given, the pleasurable anticipation of receiving food. The food itself, strange as it may sound, was only a causal condition of the flow of juice. It is an old clinical observation that in a person with a stricture of the œsophagus, the putting of food into the stomach by a fistula does not elicit the flow of juice, whereas if the food had been only tasted and chewed but not even swallowed, the juice flowed freely. Here we have a sensori-glandular reflex action, the sensation itself being of the essence of the cause. But a sensation is a mental state, that is, the mental is causal. This is some of what I mean by non-materialism in medicine.

The last point I wish to bring before you in connexion with the causality of emotions is their efficacy in dreams. The fact that dreams of sufficiently distinct emotional colouring can cause a person to wake up perspiring, trembling, with fast beating heart and so on, is no doubt quite familiar, but have you reflected on this, that the mental state is here the cause of bodily states? The hallucinations which constitute dreams are, whatever else they are, mental states; and it is they and they alone that are responsible for these well-marked alterations and activities in tissues, such as perspiration, cardio-acceleration, and so on. Of course it is certain that a state of active brain tissue is the physical basis of the dream, but that does not make the emotion, the dream, any the less a cause. For all consciousness, all vitality, has a physical basis. Of course the excited central region is the more immediate cause of the impulses which give rise to the perspiration and cardio-acceleration: but the dream, emotions, or ideas caused that brain region to be excited, for the brain is the organ of consciousness; so that at some spot in the chain of events the psychic is causal.

We must now address ourselves in some detail to the problem of nerve-energy. At the outset one cannot but recognize that the nervous system deals with energy. Various forms of energy actuate its receptors, and energy is being continually distributed to the effectors—muscles, heart, blood-vessels, glands, etc. The tone of a muscle is markedly decreased in energy after its motor nerve is severed. While it is quite true that irritability is not conferred on muscle by the central nervous system but is inherent in it, as Claude Bernard proved, yet it is equally demonstrable that the tone of muscle is only maintained at its maximum by the continual advent on to the muscle of nerve-impulses through the nerves from the centres.

In other words, the centres of the nervous system *are* dynamogenic. The central nervous system does not confer power or energy on the muscle—its own internal respiration is the source of its energy—but the continual arrival of nerve-impulses is a condition for the continual exhibition of the muscular energy. The central nervous system is the source of these impulses; without them the muscles would not have tone, would not be active; by means of them the muscles can be aroused from minimal to maximal effort.

Nerve impulses therefore are a kind of energy. Now since something cannot come from nothing, these nerve impulses must have arisen from a mechanism capable of generating them, a mechanism to that extent energy-producing.

Both physicians and the public speak of nerve-energy, of high or low nerve tone, etc. Are these things mere metaphors or is nerve-energy as real a form as heat or light or electricity? Strange as it may seem, academic physiology has not up to the present moment formally admitted the reality of nerve-energy. But the physiological psychologist, Dr. MacDougall, of Oxford, has been constrained to postulate the existence of what he suitably calls "neurine". I have, however, discovered that many years before Dr. Macdougall wrote on this subject, the eminent London physician, Dr. Hale White, suggested that as nerve-energy had a real existence it might be well to have a technical term for it, and he suggested Neurorheuma. This means "the flow in a nerve;" but something *real* must be flowing in nerves; nerve-impulses flow in nerves; and as we do not suppose that nerve-energy is something other than or distinct from nerve-impulses, neurine and nerve-impulses are identical.

When the principle of the equivalence of different forms of energy and of the indestructibility of energy was applied to animals it was found that, by leaving out the activity of the nervous system, it was possible to arrive at a statement of the quantitative relationships between, say, the food absorbed and the heat given out in an animal at rest during a sufficiently long time. In particular Rübner obtained very close correspondences between the potential and the kinetic energy in these calorimetric observations. But it was the first and the last terms of the transformations that were equated; no account was taken of the causal presence of the central nervous system. On the strength of these experiments it will not do, however, to say that the activities of the central nervous system do not enter into the dynamic chain at all. Since nerve-energy was deliberately left out of account in applying the law of conservation of energy to the animal body, it is philosophically unjustifiable now to declare that there can be no nerve-energy because if there were, it would break the law of the conservation of energy. It is bad physics and worse metaphysics. It is no reproach to physiologists that they cannot measure nerve-energy with as much ease as electricity. At present we can measure neurine only through its effects on muscles chiefly; but we can measure heat only through its effects on matter; we can measure light only through the depth of the shadows it throws or through its power to promote some chemical interaction.

Dr. Macdougall believes we are justified in speaking of high and of low potential in regard to neurine; who dare say that we shall never measure its magnitude? Who could have thought at the time when the rubbing of a bit of amber made it attract paper was all that was known of electricity, that there would one day arise the science of accurate electrical measurement?

The old notion that nerve-impulses were only releasing stimuli has been given up because it was based too exclusively on the conditions obtaining in the *isolated* nerve-muscle preparation. When we study the state of matters in the intact nervous system, we find living cells as sources of continued, rhythmical, not momentary outflow of nerve-impulses, of impulses descending to the most diverse tissues keeping these in good health, in due tone. These impulses undoubtedly vary not only in intensity but in periodicity of emission: they represent energy flowing out from nerve-centres to tissues; on the analogy of electricity they have *a potential* which as yet unfortunately has not been measured. The granules of Nissl in the nerve-cells most neurologists believe to be the physical basis of nerve-energy. It is clear that energy must be flowing into the central nervous system all the time that it is flowing out. For the sound, the light and heat, etc., of the environment are transformed by appropriate end-organs into nerve-impulses which ascend continually into the cells of the central nervous system. But just as a muscle by its own oxidations is a source of heat and work, yet needs the continual inflow of nerve impulses to cause it to keep up these metabolic and dynamic transformations, so analogously, although the chemical metabolism of the granules of Nissl is the physical basis of the output of nerve-energy, the granules only metabolize properly under the influence of incoming neural energy.

All the sense organs, therefore, are pouring nerve-energy into the central nervous system, and as soon as these ascending nerve-impulses are cut off, the tone of the central nervous system is distinctly lowered, the whole individual either goes to sleep or becomes profoundly depressed; while, conversely, stimulation of the sense-organs by pleasing sounds, bright lights and a comfortable temperature visibly raises the tone of the nervous system. This incoming energy is of course entirely from without; the sun's light and heat are the ultimate cause of our nerve tone; so that for our well-being we are as dependent on the exhibitions of cosmic energy as are the flowers.

The next topic under non-materialism in medicine which I wish to bring to your notice is one in the sphere of ethics.

No declaration of the principles of medical behaviour ever yet placed before the profession is better than that said to have been composed by Hippocrates. That Hippocrates wrote it has been doubted, but the oath is always known as Hippocratic. The oath of Hippocrates is an admirable rule of conduct for the medical man.

Doubtless a much more elaborate and comprehensive declaration could be drawn up, but it is questionable whether it would be an improvement on the pagan's. It is the tenor or spirit of this declaration that is important. To one detail in it I should like to draw attention—the passage which mentions professional secrecy. The translation by the late Professor Young of Glasgow is as follows:

"Whatever I shall see or hear even when not called in for medical attendance, whatever I shall come to know in the ordinary intercourse of life, which it would be improper for me to repeat, I shall keep silence regarding it. I shall hold it secret. May I, keeping this oath in its entirety, enjoy my life and art in happiness, and have credit among all men for all time. May the opposite befall me if I break it."

This injunction to treat as confidential what the patient may reveal to us has been scrupulously observed by many generations of medical men. But I have reason to believe that this wise provision is not so carefully observed here as it should be. The profession will pardon my being outspoken in this matter. I have had to listen to quite a number of complaints from patients and their friends as to the way in which their cases have been discussed in assemblies of laymen, in clubs and in general society. Now no one will maintain that this is as it should be, indeed it is diametrically opposite to what should be. While I think the suggestion I once heard that there should be a chair of Medical Ethics at Dalhousie University perfectly absurd, even if funds were available for such a purpose, yet I do believe that the young men, for whose training we are responsible, should have such examples of propriety in this respect put before them that the last thing they would dream of would be to betray any patient's confidences. The form of Latin oath which is taken by the graduates in medicine at Dalhousie University is evidently based on the Hippocratic. As it is possible that owing to its being in Latin, its full import has not been appreciated by some who have subscribed to it, I give it in the translation kindly made for me by Professor Howard Murray:

"I, who am now on the point of having bestowed upon me the title of Doctor in the Profession of Medicine, do in the presence of Holy God, the Searcher of Hearts, promise that I will continue in the performance of every duty pertaining to a grateful heart towards Dalhousie University up to the latest breath of my life. Then, further, that I will practise the Profession of Medicine carefully, virtuously and honestly, and, as far as shall lie within my power, will give faithful attention to all things which may contribute towards the restoration of the sick. And, finally, with regard to matters seen or heard in the practice of the healing art about which secrecy ought to be maintained, that I will not divulge these without serious cause. As I promise these things may the Deity vouchsafe to me His favour and assistance."

I am quite aware that under certain circumstances, moral or medico-legal, certain professional secrets may have to be revealed at the proper time and to the proper person, but this sort of thing is quite other than discussing cases in lay society as one discusses the war or the weather. Nor are the laity blameless in this matter: if they do not wish their cases discussed in general society, they ought to be very careful not to request information to which they have no claim. "Oh, Doctor So-and-So, what is wrong with Mr., Mrs., or Miss So-and-So?" is an exceedingly reprehensible form of question. You might just as well call on his banker and ask the amount of Mr. So-and-So's bank-balance.

The last aspect of my subject is the notion that science and especially the medical sciences lead of necessity to a materialistic view of life; to one in which the contemplation of moral and physical beauty is wholly subordinated to the search for physical truth.

It is contended that since it is the office of all science to reduce facts to law and order, that science is necessarily in opposition to everything that is still mysterious, intangible, non-material or not as yet accessible to mathematical treatment. I can discover no mind of the first order in science at any time since the Renaissance which could be called irreverent or irreligious. Paré, Descartes, Pascal, and in our own time Pasteur, all of them minds of the first order, were to the end of their days loyal sons of their church. I am not thinking of minds of any rank below the highest: the character of the cabinet of a nation is not deduced from the views or the personal morals of the clerks and stenographers in the government offices. Doubtless I shall at once be told that Professor Haeckel is an atheist and a materialist confessed. I shall make no attempt to remove that impression; yet I would remind my critics that even he has postulated consciousness as a universal property of matter, and whatever consciousness is, it is certainly not material. But might I point out where the soulless ideals of German science have led that nation—towards the depths of the bottomless pit of infra-human cruelty.

English scientific minds of the first order have always been reverent; Dalton, the founder of modern chemical theory, was a devout Quaker; Huxley, calling himself an agnostic—itself a title of humility—was yet a profoundly reverent man, and Darwin, his master, was certainly not irreverent.

One must judge science by its masters and not by its novices, just as we judge poetry by poets not by poetasters. The asseveration made in some quarters that science is a cold, soulless, character-destroying thing, recognizing no moral values and opposed to æsthetic and poetic instincts is a lie. I declare as solemnly as I can, that science is not opposed to the appreciation of beauty, or alien to the poetical disposition, to moral values or to the Christian religion. Is not all true science but a systematized search for truth? And "what is truth?" asks some modern Pilate. Truth is what men of scientific character search for, value, and seek to declare. Science is indeed impersonal, but it is not inhuman; for it can force a man to lay aside his predilections and even his personal comfort if they hinder him in the quest for truth.

Philosophy in the sense of science is neither cold nor proud: has she not laid all her treasures at the feet of humanity? The day has long passed when a poet could write with our approval:

"Triumphal arch that fill'st the sky
When storms prepare to part;
I ask not proud Philosophy
To teach me what thou art."

Proud only in the sense of her achievements in that she has opened the inmost treasure-house of wisdom and knowledge for the benefit of all mankind. She may indeed be proud of that: may we never, like our enemies, misuse and debase these treasures.

Instead of pride, true science, and especially medical science, teaches its student humility—humility in that he knows so little of the knowable. It teaches him patience, since there is no royal road to anything that is worth having; it teaches him steadfastness when opposed and fortitude even when misrepresented.

Science teaches us reverence for life and respect for what are called "the lower creatures;" it teaches us that a living thing is a wonderful creation. It reveals marvels of mechanism which man has but discovered and copied æons and æons after they had been in operation in animal bodies. Pulleys, levers, valves, lubricated surfaces, lenses, sensitive plates, iris-diaphragms, media as transparent as glass, the utilization of negative pressure, electric current and phosphorescence; all were in existence ages before man himself appeared.

Medical science teaches us with all the emphasis of the Great

Sheet in Peter's vision that there is "nothing common or unclean". I sometimes read the phrase "disgusting physiological details". There are none. It is not the details, but the places where certain persons have put them, that are at fault. "Dirt is matter out of place," as Lord Palmerston said, and that definition applies generally: "there is nothing either good or bad, but thinking makes it so".

Having spoken of animals let me say that men of science, yes even physiologists, contrary to the popular idea, are as fond of animals as other people. We all know about Newton's dog "Diamond"; Lord Kelvin had a favourite parrot; and Dr. A. D. Waller is inseparable from the bulldog "Jim."

Let me now tell you how a physiologist died in the service of a lower animal. My friend the late Dr. Page May, the eminent neurologist, was walking along a street in Brighton when he noticed a carter ill-treating a lame horse; he reproved the man who replied in the unrepentant blasphemy of his kind. Dr. May's righteous indignation was so roused that he went over to give him a little of the same treatment he was giving his horse, when he burst a cerebral blood-vessel and died within a few minutes. This was at any rate one physiologist who was not cold-blooded.

Medicine teaches us sympathy, sympathy with the naturally weak and with the congenitally less well endowed. Knowing the heights and the depths of human nature, the man of medical science knows how much to expect and yet not to expect too much. Understanding somewhat of the meaning of the words, "He knoweth our frame, He remembreth that we are dust," he agrees with Burns:

> "Then gently scan your brother man,
> Still gentler, sister woman."

If anyone may, the man of science may, hold with a good conscience that "to know all is to forgive all."

Now in conclusion as to the non-material I am going to be very bold and declare that medical science is in no way incompatible with a full appreciation of beauty. Keats declared that Newton by his mathematical explanation of the colours of the rainbow, had destroyed its beauty. Keats here is surely wrong. To the physical beauty of the rainbow, Newton added the intellectual beauty of a rigid, scientific explanation. The search for facts can perfectly well go hand-in-hand with that for beauty: because I study the histological details of the hexagonal pigmented layer of the retina or the intricacy of the organ of Corti, I am none the less alive to the matchless beauty of detail in these wonderfully constructed mosaics. As we stumble on in the darkness of ignorance after the morning star of truth, we are ever and anon comforted with precious glimpses of an order of things where beauty reigns. Goethe once said—"See one fine picture, read one fine poem, hear one fine piece of music every day"—and I venture to assert that if that advice had been only attempted to be followed by his countrymen, the cataclysm we are witnessing on the continent of Europe would have been absolutely impossible. Of all the spirits suffering in that terrific catastrophe, surely the spirit of beauty is the one most tortured. "Oh, spirit of beauty, descend and abide here"! is the watchword of culture; and it is no empty shibboleth; but whatever cult cannot say "amen" to it is no form of culture whatsoever.

But I am going to be bolder still and assert that no science, not even medical science, is opposed to poetry—contrary as this is to the popular belief. Coleridge said it *was* science that was opposed to poetry, that poetry was the antithesis not of prose but of science. I find myself again differing from an eminent philosophical authority. If "the devout astronomer is mad", the unpoetical man of science is incomplete. May I remind you that some of our truest poets have either been medical men or have had some medical training, for instance Dr. Donne, Sir Thomas Browne, Goldsmith, Akenside, Erasmus Darwin, Keats and Oliver Wendell Holmes. Nor are poets wanting even in our own prosaic day. The well-known man of science, Sir Ronald Ross, only a year or two ago published a book of spirited verses.

Finally, to sum up, I would say that true science is not opposed to Christianity as distinguished from Ecclesiasticism, nor does it fail to recognize moral values. Its influence rightly exerted is not irreverent, cold, unsympathetic nor destructive of character. The love of science is compatible with a love of beauty and with the poetical disposition. Just as the test of a religion is the ability of its believers to die for it, so are martyrdoms by no means unknown in the records of scientific discovery. Science's worshippers, too, can endure hardship; they know full well the trials of the ascent of that intellectual Pisgah from whose summit even they can hope to gain only a glimpse of the Promised Land. Are there not martyrdoms in the annals of the scientific faithful? We know that there have been trials far more terrible because more subtle than the stake or the rack, fiery trials which have been endured only through the hope of attaining to some discovery more beneficent still—the fadeless crown of the life of the searcher after truth.

A CASE OF LARGE CELLED SPLENOMEGALY*

(GAUCHER TYPE)

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IN 1882 Gaucher described a case of splenomegaly, in which the presence of numerous large cells was demonstrated in the spleen. Since this date about twenty cases, in which the clinical and pathological findings were identical with those in the one described by Gaucher, have been reported by various writers. The more recent writers on the subject, including Marchand, Schlagenhaufer and Risel, agree in the opinion that in these cases we are dealing with a constitutional disease, chiefly affecting the lymphatic and hæmo-poietic organs. The condition is of special interest in view of the controversy which has arisen in relation to the origin and nature of the large cells and the absence of any definite ætiological factor. The case which we are reporting was admitted into the Toronto General Hospital under the care of Dr. Bruce on February 6th, 1911.

H. E. R., male, aged forty-six years; married.

Family history. It was difficult to obtain any definite family history. The parents had both lived until over sixty, and the brothers and sisters of the patient are all alive and in good health. We have not been able to discover whether he is of Jewish extraction or not, but think it likely.

Personal history. The patient was born in Ontario, but had also lived in New York State and Southern California. He was not in the habit of using alcohol or tobacco. Some years ago, when in Mexico, he suffered from tertian malaria, from which he subsequently recovered, and twenty-two years ago he had facial erysipelas. He states that he is a Christian Scientist, and has therefore taken no medicine of any kind for years.

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*This paper was presented at the meeting of the American Association of Pathologists and Bacteriologists in Chicago, April, 1911, and a few weeks later at the Inter-urban Surgical Club, Montreal.

Present illness. The patient states that he has not felt well for the last ten years. About three years ago he first noticed swelling of the abdomen, and on palpation a tumour was felt, extending as low down as the umbilicus. He has since suffered from occasional attacks of numbness in the legs. The tumour gradually increased in size, and six months ago he began to feel tired and weak, and also depressed and irritable. At this time the skin became bronze in colour. He has had one or two attacks of swelling of the legs, and during the last six months has been unable to walk any distance owing to weakness and lassitude, which progressively became more marked. There have also been occasional attacks of nose bleeding. He states that he is unable to lie on the left side or back on account of a dragging sensation in the abdomen. He has suffered from gastric distress after food, and this has prevented his taking much nourishment.

Physical examination. On admission to the hospital he was seen to be a well developed, but poorly nourished, man. He exhibited diffuse bronze pigmentation of the skin, and prominence and distension of the abdomen, which were most marked on the left side. On palpation a large abdominal tumour could be felt, extending in a downward direction to the pelvis, and three inches to the right of the median line. Its surface was smooth, and it moved slightly with respiration. It was dull on percussion, the dulness being continuous with that in the left hypochondriac region.

The heart was displaced 4 centimetres to the right, but was otherwise normal. The lungs were also normal, and the liver not enlarged. The muscular, glandular, and nervous systems were normal.

The urine gave an acid reaction, and the specific gravity was 1030. It showed a trace of albumin and a moderate amount of urobilin, but no sugar, acetone, or bile.

Examination of blood. Red blood corpuscles 3,500,000; white blood corpuscles 4,800; hæmoglobin 65 per cent. Sahli. There was slight poikilocytosis, and a few microcytes and macrocytes, but nucleated red cells were absent, and there was no polychromatophilia or stippling.

Differential count.

Polymorphonuclear leucocytes	44 per cent.
Small mononuclear lymphocytes	42 per cent.
Large mononuclear lymphocytes	8 per cent.
Eosinophiles	5 per cent.
Mast cells	1 per cent.
Colour index	0·9

A diagnosis of splenic anæmia was made from the above findings, and splenectomy accordingly advised. The operation was performed on February 7th, by Dr. H. A. Bruce.

At the time of operation examination of the liver showed slight enlargement, but no ascites was present. The patient made a good recovery from the operation, the bronze pigmentation of the skin became less marked, and he stated that he felt that he "had a new lease of life." On the day after operation the blood exhibited the following condition.

White blood count.	11,040
Differential count.	
Polymorphonuclear leucocytes	76 per cent.
Large mononuclears	13 per cent.
Small mononuclears	7 per cent.
Eosinophiles	2 per cent.
Basophiles	2 per cent.
Red blood count.	3,200,000
Hæmoglobin	65 per cent.

The proportion of red corpuscles remained the same as before the operation. The patient was discharged from the hospital on February 26th, when examination of the blood showed:

Red blood corpuscles	4,100,000
White blood corpuscles	9,400
Hæmoglobin	65 per cent.

This last examination of the blood showed, as compared to the previous examinations, practically no change in the differential count or the qualitative changes in the red corpuscles.

Clinical summary. Male aged forty-six, of probable Jewish extraction. Other members of the family are well, so far as could be ascertained. Had tertian malaria twelve years ago, and for the last ten years has not felt so well as before. The chief symptom during the last two years has been the enormous enlargement of the spleen. Other symptoms, which developed more recently, were marked weakness, bronze pigmentation of the skin, loss of weight, epistaxis, and a moderate degree of simple anæmia, with leucopænia. Splenectomy was successfully performed. The patient made a good recovery from the operation, and at the time of publishing this article, he is enjoying good health.

Pathology. The gross examination of the spleen showed the following conditions: weight, 5200 grammes. Its surface is smooth, and it is moderately firm in consistence. Palpation reveals the presence of several small and irregularly scattered nodular areas. On section the general colour of the organ is seen to be a light reddish grey, the nodular areas above referred to being of a greyish colour, and of firmer consistence than the surrounding tissue. They vary in diameter from 0·5 to 2 centimetres. On close examination numerous small greyish white points and lines are visible. Scattered areas exhibit a deeper red colouration, and in these the surface is granular, and shows numerous structures resembling blood sinuses or vessels, which project slightly from the surface.

Histological examination. Tissues were preserved in 10 per cent. formalin and Zenker's fluid ten minutes after the removal of the spleen. Smears from the cut surface were also made, and the cells examined in a fresh state. Risel has demonstrated that the cells in sections of formalin-fixed tissue, when examined in water, show the same characteristics as fresh cells, and our experience confirms this opinion. These preparations show the presence of numerous large and somewhat irregular polygonal cells, exhibiting a glistening hyaline appearance. They occur sometimes in masses corresponding to the greyish white deposits of various sizes mentioned above, whilst in other areas they are deposited in the pulp in small circular or longitudinal alveolar cavities, often enclosing cells which have desquamated, together with blood. These latter areas correspond to the deeper red granular areas referred to previously. In some of the cells small granulations are present, but in the very large cells these have disappeared. These larger cells exhibit a fine streaking, and appear to contain an indistinct crystalline substance. Their nuclei are round and comparatively small, and situated at the margin or in the centre of the cell. Many of them are multinuclear, and contain three, four or more nuclei. There is a conspicuous absence of mitotic figures. Occasionally the cell bodies show processes or prolongations. In many of them a brownish yellow pigment is deposited in the form of fine granules or irregular rods. This deposition of pigment is less in the more solid areas, and very marked in the cells filling and lining the blood sinuses. The characteristic homogeneous stratified masses are best seen in those cells which do not contain pigment. An occasional red blood corpuscle occurs in their cytoplasm.

As Risel has pointed out, the condition does not appear to be a true hyperplasia, but is chiefly due to a deposition of some foreign substance in these cells. The methods which we have used for investigation into the nature of this substance from a microchemical standpoint are identical with those employed by Marchand and Risel. Stains for fat, glycogen and amyloid were negative. With Millon's reagent the cells stained a brownish red. When

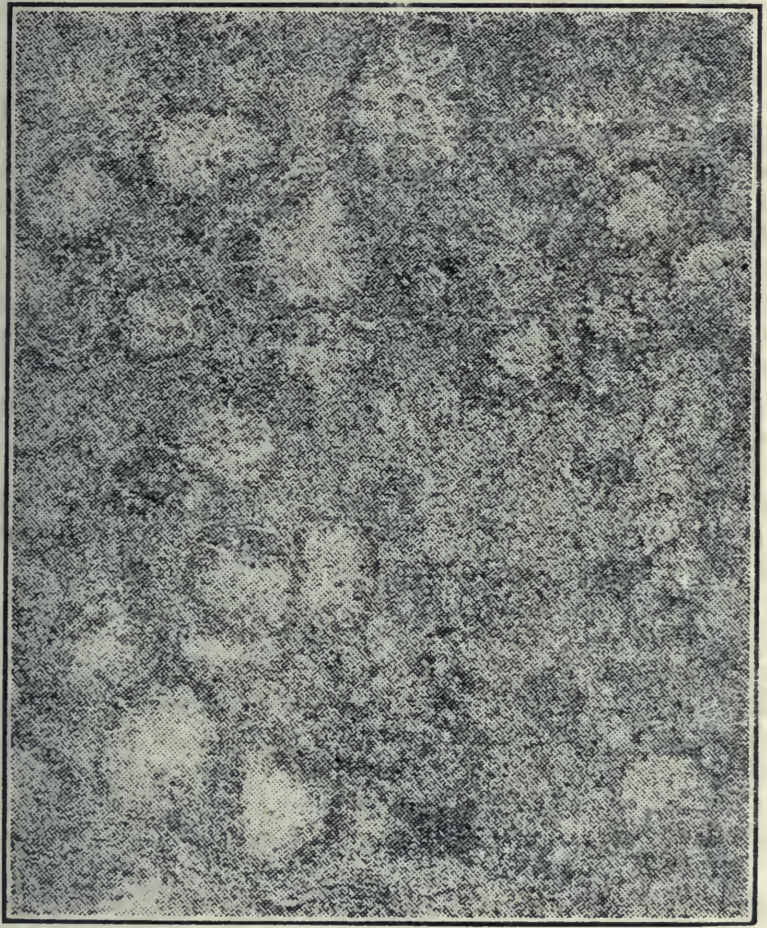

Fig. 1 x 140—Shows general type of reaction in spleen.

treated with acids and alkalies there was no perceptible change in their protoplasm. With treatment with alcohol, ether, chloroform, xylol and acetone they became more transparent and assumed a vacuolated appearance. In the digestive experiments carried out by Risel it was found that the nuclei disappeared within twenty-four hours with pancreatic digestion, but that digestion of the cells themselves was not complete for eight days. With pepsin digestion the cells disappeared completely within forty-eight hours.

Sections of material fixed in Zenker's fluid were stained by eosin and methylene blue, Mallory's connective tissue stain and Mallory's phosphatungstic acid hæmatoxylin. In place of the normal arrangement of follicles, trabeculæ and pulp, the connective tissue is seen to extend into the other splenic tissue in the form of radiating bundles, which spread out into a delicate reticulum, that is closely related to the large cells. The splenic tissue contains very few lymphoid follicles. The splenic pulp is completely replaced by numerous large pale-staining vacuolated cells, sometimes surrounding alveolar spaces, but as a rule occurring, in solid masses closely packed together. The alveolar spaces are irregular in size and shape. In some places they consist of narrow fissures. In other areas they are larger, and contain moderate numbers of red blood cells, and quite a number of large cells, which lie perfectly free in their lumina. These spaces are circumscribed by delicate connective tissue fibres, which support a few longitudinal flat cells, often having a projecting nucleus. The large cells related to these are less vacuolated and somewhat smaller than those which are free in the lumina.

The large cells appear as clear structures of irregular size and shape. As a rule they are round, oblong or polyhedral, and sometimes exhibit short processes. Their contour is often wrinkled, and looks as if shrivelled. They measure from 20 μ to 40 μ in diameter. With eosin and methylene blue the nuclei stain fairly well, but the protoplasm stains faintly. The latter is large in amount, semi-transparent, and frequently shows vacuolation. The nuclei are irregularly distributed, small and frequently multiple. In the larger cells they are usually situated at the periphery. The finer details of the cell structure are best shown by Mallory's phosphatungstic acid hæmatoxylin stain. With this stain, it appears that the characteristic vacuolated and honeycombed appearance of the cell bodies is due to a delicate network of fibres, which stain more deeply than the remainder of the cytoplasm. As a rule these exhibit a somewhat concentric arrangement, but may also occur as radials or stripes. The vacuoles vary as to size, shape and number in individual cells, the largest cells generally containing the largest and the greatest number of vacuoles. In the protoplasm of some of the cells there is a considerable amount of brownish granular pigment, which occurs in the largest quantities in the cells lying free in the sinuses, and gives the ferric reaction.

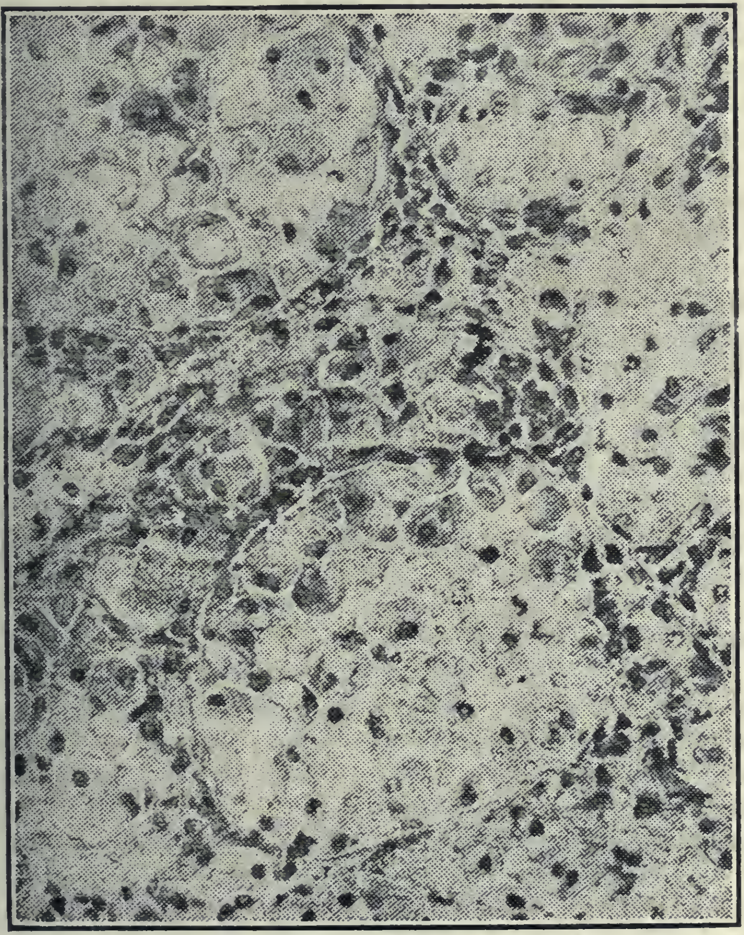

Fig. 2 x 375—Shows alveolar spaces, lined with endothelial like cells, some of which are free in the lumen.

There is unquestionably a close connexion between the large cells and the delicate reticular fibres which pass between the cells into the cell-nests. Risel found this connexion more marked in the bone marrow.

The few lymph follicles present are irregularly scattered, but as a rule arranged in the ordinary manner. Their supporting connective tissue is scanty and extremely delicate. No large cells are observed in them. Other smaller and isolated aggregations of lymphoid tissue are present between the masses of large cells. Eosinophiles occur in varying numbers in the blood sinuses and throughout the more solid areas.

In the cases in which a complete examination of all organs has been possible the following pathological conditions have been present. Some groups of lymphatic glands are enlarged, and show the same changes which have been described in the spleen, the perigastric and retroperitoneal glands in the neighbourhood of the spleen exhibiting the most marked changes. The inferior retroperitoneal, mesenteric and axillary glands are only slightly involved. In the bone marrow also cell bodies resembling those in the spleen and lymphatic glands are present. They are seen in the whitish spotted foci of the sternum or the epiphyses of the long bones, and also in the larger whitish or yellowish foci in the diaphysis of the femur. The large cells are absent in sections taken from the tonsil and through Peyers' patches in the intestine. The entire intestinal wall, from the muscularis mucosa to the peritoneum, contains large quantities of brownish pigment.

In the liver the hepatic tissue itself is but little altered. There is, however, a moderate increase in the inter-acinous connective tissue, in the meshes of which a few of the characteristic large cells are present. These cells are also observed in the large and small branches of the portal vein, in which post-mortem clot is present. The wall of the portal vein shows no cells, but they are present in the peri-portal connective tissue.

The lungs are practically normal. The kidneys are also normal, except for a deposit of brownish granular pigment in the connective tissue between the descending tubules in the medulla.

The brain is normal. The pancreas shows pigmentation of the vessel walls, but no large cells. Risel in his case observed in the thyroid a collection of large cells resembling those in the spleen. There was extensive extravasation of blood in the muscles of the thigh, together with a proliferation of connective tissue between the muscle bundles, which frequently contains brown pigment.

Various views have been advanced by writers in relation to the process at the base of this disease, namely, epithelioma, endothelioma of the spleen, endothelial hyperplasia, and reticular proliferation in the lymphatic system. Gaucher himself regarded the cells as epithelial in origin, and the condition as a primary epithelioma. Targett, Newton Pitt and Shattock, who discussed Collier's case at a meeting of the Pathological Society of London, refer to the endothelial character of the cells. Bovaird, Brill, Mandlebaum and Libman regard the condition as an endothelial hyperplasia. Schlagenhaufer thinks that there is little resemblance between the large cells and the endothelium of the vascular sinus.

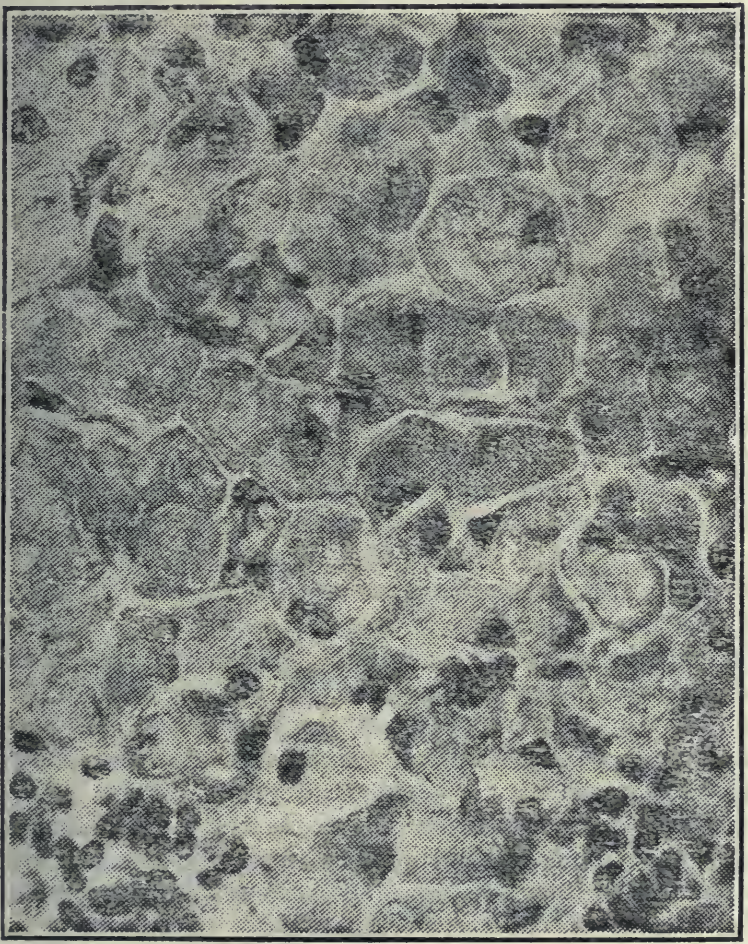

Fig. 3 x 759—Shows characteristics of large cells.

He has also noted that the endothelial cells of the sinuses frequently contain blood pigment, but has been unable to find any mitotic figures in them. He agrees with Cornil that the condition is due to a proliferation of the reticular tissue in the lymphatic and the blood forming organs. Marchand states that the origin of the large cells from reticular cells or endothelial cells is not improbable, but does not definitely commit himself. Risel, as a result of careful investigation, arrives at the conclusion that the large cells originate from those of the reticulum rather than from the endothelial cells of the venous sinuses. Josselin de Jong and Van Henkelm agree with Cornil, Schlagenhaufer and Risel as to their origin from the reticular tissue.

From the examination of the spleen in the case reported above, the histological findings would suggest to us that the large cells are of endothelial origin rather than of reticular origin. There seems to be in some areas evidence of a gradual transformation of the spindle-like endothelial cells lining the blood spaces into the large cells, which often lie free in the spaces. In the examination of formalin sections, unstained and mounted in water, we found that in some areas both the large cells and the spindle-like endothelial cells lining the sinuses contained the brownish yellow pigment. In conditions where there is rapid proliferation of endothelial cells there are nearly always mitoses in some of these cells. Owing to the fact that this disease runs an extremely chronic course the absence of these mitoses is easy to understand.

Weidenreich has shown that the reticulum of the spleen is cellular in character. The close relationship of this reticulum to the cells in question is in favour of their origin from it. On the other hand there is no definite evidence of transition between the reticulum and the large cells.

As regards the origin of the pigment, which is so abundant in the skin, spleen, lymphatic glands, bone marrow, and the smooth and striped muscle, we may point out that in our own case, as well as in those reported by Brill, Schlagenhaufer and Risel, no arsenic had been previously administered to the patients. This fact excludes the assumption of arsenic melanosis as an explanation of its presence. In view of the fact that this pigment gives the ferric reaction it is probably due to hæmachromatosis.

Whilst the majority of investigators agree in the opinion that some specific foreign chemical substance is deposited within the large cells, the nature of this substance is as yet unknown. Amyloid, glycogen and fat are excluded by the fact that the microchemical reactions are negative for these substances. The slight proteid reaction suggests the presence of an albuminous compound. Elizabeth von Beckendorff derived it from the red blood corpuscles, and regarded it as a body closely related to the colloid of the thyroid. Professor J. B. Leathes, who made a chemical examination of the spleen in our case, found that the amount of iron present was much increased, the total amount being four grammes of ferric oxide, which is more that the total amount present in the blood under normal conditions, the latter being three grammes. He also states that a considerable proportion of this iron is present in the form of lipoids. On the other hand the total amount of fat was diminished, being only about one third of that normally present.

Various hypotheses have been advanced regarding the cause of this remarkable disease. It has been shown that in most cases the disease commences in childhood. The familial occurrence of the disease is well established, as many as four cases having occurred in one family, only three previous cases and the one now reported forming exceptions to this rule. In the majority of instances it appears to have affected individuals of Jewish extraction, and all the cases reported, with the exception of four, have occurred in females. In four or five cases there has been a history of typhoid fever several years previously. In three cases active tubercular foci were present in other parts of the body (Gaucher, Schlagenhaufer and Collier). In our case there was a history of chills and fever, with a diagnosis of malaria. In one other case, namely, that of Rollys, there was a history of chills twenty years previously. Schlagenhaufer believes that there is an irritability of the reticular tissue of the organs involved, due to the influence of a toxin, probably of tuberculous origin. Bovaird blames a systemic poison of unknown origin. Schridde speaks of tissue malformation, and suggests a congenital disease. De Josselin de Jong and Van Henkelm also suggest congenital developmental abnormalities as the most probable cause. We are inclined to believe that a parasite of some sort or other is probably the cause of this disease, but so far we have been unable to demonstrate the presence of any in our case.

A SPECIAL committee has been formed, under the auspices of the Anglo-Russian Committee in London, to arrange for the equipment of a complete hospital unit for service in Russia.

THE SUBCUTANEOUS ADMINISTRATION OF FLUID IN ACUTE AND SUBACUTE CONDITIONS IN INFANCY*

By Roy P. Smith,

Resident Physician, Hospital for Sick Children, Toronto

OWING to a recent search of the literature, combined with the use of fluid administered subcutaneously in the treatment of the various conditions of infancy on this service, during the past four months, it was thought that a presentation of the work and results obtained would be interesting. In the administration of fluid in the cases of this series, the main object was to replace as far as possible the body fluid lost in the progress of the disease.

Quinton in 1910 advocated the use of sea water plasma, his idea being that all superior organisms had their primary environment in the sea and have retained a blood plasma whose mineral constituents are identical with those of the original seas. It is readily agreed that the original medium which exists previous to disease is necessary to all cellular life and that it is changed and deteriorated in certain affections of infancy prominent amongst which are the intestinal disturbances such as fermentative diarrhœa, decomposition, intoxications and infections. He found that with the injection of the sea water diluted he could correct the existing medium in these cases and the cells would take on a new lease of life.

McKenzie of Aberdeen, in 1912, went further and used normal saline solution and sterile distilled water, basing his results on the fact that he increased the blood pressure in the cases to which he administered the fluid and in this way brought about the desired result. In so raising the blood pressure one promotes an increased secretion of urine, thus increasing the elimination of toxins. This, then, is the opposite view to that of any particular or isolated constituent of the fluid which produces the change.

The patients to whom saline was administered in this series were those in whom there was more or less fluid loss such as

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From the Infants' Department. Service of Dr. Alan Brown.

occurred in decomposition, acute intoxications, infections and fermentative diarrhœas. The loss of fluid was particularly evidenced by the degree of dehydration and loss of tissue turgor both of which being readily elicited or measured by pinching and raising the tissues between the index finger and thumb, in that manner demonstrating the laxity of the tissues which in reality is but an index to the amount of subcutaneous fluid present. In addition to these most prominent symptoms, the presence of a depressed fontanelle, prostration, and cold extremities indicated to us the necessity of administering subcutaneous fluid; similar to these were those upon which McKenzie made his observations.

In acute intestinal diseases by far the greatest portion of fluid lost, is by the fæces, only a small amount by the urine. This fluid lost, is mostly made up of organic salts. By metabolic observations, it has been found that the greatest loss has occurred in the sodium and potassium salts; in severe cases, this loss being as much as eight to ten times the normal output of these respective salts. Calcium, magnesium and phosphorus are lost in very much smaller amounts. In moderately loose stools, the total ash excreted has been found to be one eighth more than the normal, while in very loose and even watery stools, the ash is increased to even twice that of the normal.

The solutions used were of two kinds, viz.; normal saline and 4 per cent. dextrose saline. On account of the scarcity of the dextrose it had to be omitted and for the past two months normal saline solutions alone were used. Dextrose is the most assimilable sugar and it has been found that a combination of dextrose and saline is more assimilable than saline alone. Furthermore, the organism is known to utilize the dextrose first, before its destruction of the body protein, to produce energy and heat. In this manner it may be spoken of as a protein-saver, which clinical experience shows to be the case. In addition it carries with it a definite caloric value, viz.: 4·1 calories per gramme. In the use of a 0·9 per cent. saline we have a fluid which is isotonic with the blood, in other words, a physiological salt solution. The method of preparation is worthy of note. One tablet of sodium chloride which is equal to 1·0 gramme c.p. is dissolved in 120 c.c. of freshly distilled water. This is then filtered twice through lamb's wool, the latter being found to be better than glass wool, the particles of which had a tendency to filter through into the saline and were in one or two cases the cause of irritation of the abdominal wall producing a local reaction. After being filtered twice the saline is sterilized for forty-five minutes in the steam sterilizer and is then ready for use. In the preparation of the dextrose saline 4 grammes of dextrose (Merck's C.P.) is added to 96 c.c. of 0·9 per cent. salt solution and then sterilized.

The following apparatus was employed in the administration of saline: A glass Erlenmeyer flask of 1000 c.c. capacity and marked accordingly, equipped with a perforated rubber cork through the perforations of which were passed two glass tubes—one long and one short—which when the flask is inverted act as a siphon. A stand was constructed which is attachable to the side of the cot consisting of a long strip of band iron about 4 feet in length, at the one end of which is a thumb screw fastening it to the upright rod, at the other end a loop to support the flask. This gives an elevation of 4 feet above the child. The glass tubing connects with a rubber tube about 4½ feet in length with a stop cock to compress it while the insertion of the needle is being made. An ordinary hypodermic needle of medium-sized bore is employed. At one time needles of a larger bore were used with windows at the side of the needle, but these were unsatisfactory because they produced considerable trauma, and the aperture left in the skin was large enough to admit of the escape of fluid, when the subcutaneous space was filled, and the tissue distended with fluid.

When the fluid is about to be administered the flask of sterile saline solution is heated to 120° F. All apparatus except the stand being previously sterilized. The administrator's hands are then scrubbed and care is taken to keep all tubing, etc., as sterile as possible. The infant's arms are confined in such a manner as to prevent undue movement in order that the needle may not be dislodged. The site of injection is painted with a 2½ per cent. solution of iodine and the needle inserted. It has been the practice to withdraw the needle a short distance to allow of the free escape of saline into the surrounding tissues. When the flow is thus established as evidenced by the tumour which forms and enlarges rapidly or slowly, depending on the amount of dehydration present, it is safe to let the needle remain *in situ* until the subcutaneous space is filled. The average length of time consumed in administering fluid is in the neighbourhood of thirty minutes. An important point in the administration is to guard against the entrance of air into the tube. This is readily accomplished by allowing some saline to flow away before the needle is inserted. If air is allowed to be forced beneath the skin, the only resulting condition has been surgical emphysema. Where this occurs, it affects the amount of saline which can be administered.

The site usually chosen is the abdomen, for here the dehydration and loss of tissue turgor are most evident and in addition the folds of the skin when distended by saline, allow of the administration of about 300 to 450 c.c. daily as a rule. In cases of pyloric stenosis after operation where the saline was administered to replace the loss of body fluid which is usually pronounced as the food decomposition advances, the site of injection was between the scapulæ in the loose subcutaneous tissue in that region, the infant lying with his face down and secured in that position. In a few cases the axillæ were used under the lower border of the pectoralis major muscle, to allow of the excape of the fluid into the axillary space. In one instance 750 c.c. was given at a single administration and inside of twelve hours almost all the saline was absorbed.

When the child is prostrated, the vitality low, and the circulation poor as evidenced by cyanosis and coldness of extremities, atropine sulphate subcutaneously is given, in doses of 1-1000 gr. after each hypodermoclysis. Atropine, besides being one of the most efficient respiratory stimulants, is most effective in aiding in the absorption of fluid. In a few cases where the dehydration was very great atropine was not given at first but given in the succeeding administrations when it was found that from one-half to three fourths as much more fluid could be given and that the absorption was more rapid.

The average quantity administered in this series was about 350 c.c., or over ten ounces. The indication for the amount depends entirely upon the cases on admission or when administration is begun. For instance, if an infant presents itself with marked dehydration, loss of tissue turgor, great weakness and symptoms of collapse, the indications are for the administration of fluid to the fullest capacity at intervals of three hours. In such a case the cry is for body fluid as the cells are dessicated and the sooner one restores the original medium, the sooner improvement will commence. Thus one can say that the amount and interval varies directly as the indications for such in the infant. The absorption of the saline is rather slow in some cases where the vitality of the child is poor, coupled with bad circulation and exhibition of symptoms of collapse.

Does the introduction subcutaneously produce an elevation of temperature, and if so, to what is it due? A great deal of discussion has taken place in the recent literature over this point of thermal rise after injection of fluids. The main conclusions arrived at are as follows; 1st. To use a saline made from freshly distilled water. 2nd. To use saline free from bacteria and bacterial toxins. Saline, as commonly used prepared with distilled water that is not fresh, produces an elevation of temperature following injection. In cases of this series to which saline, made from known freshly-distilled water, was administered, no thermal rises were noted. Again, on the other hand, where saline was administered made from distilled water that was not fresh elevations of temperature were noticed. This occurred in six of the seventy-two cases. In one case notably did an elevation of temperature result, which dropped to normal as soon as the administration was discontinued. When it was resumed, the elevation was again present. In another case the resulting temperature was due to an over-dose, the larger the amount the greater the disturbance of the thermo-regulating centre. Thus the others are apparently due to the distilled water, no other cause existing in the infant's condition. Theories advanced as to the cause of the temperature are as follows; 1st. That the children suffering from intestinal disturbances are liable to have a slight thermal rise. 2nd. An action of the administration of saline upon the heat regulating centre. 3rd. A destructive change in the cell itself and a reaction to the cell change by the salt administered. 4th. The question of bacteria or bacterial toxins in the water. Bendix and Bergmann used a freshly distilled water to make their injections and in no instance had a rise in temperature. In the one case of the series where a large dose was administered the temperature was initial, i.e., after the administration and did not reoccur when the repetition of smaller doses took place. While six of the seventy-two cases were suffering from a complicating bronchitis, bronchopneumonia or blood infections, along with the intestinal disturbance, we may say that in all these cases there were irregular elevated temperatures and it is impossible to say whether or not the salines were wholly responsible for part of them.

The immediate effect of the administration in all of these cases was striking. The general condition was much improved, the toxic symptoms, except in moribund cases, disappeared in from twenty-four hours up to a few days' time. In the intestinal cases during the warmer weather, which formed the bulk of the patients in this series, to which saline was administered, the effect was very marked. An infant on admission having frequent stools, vomiting, loss of weight, marked dehydration and loss of tissue turgor invariably, unless moribund, responded in the first twenty-four hours, so that part of the symptoms disappeared and the child's general condition was improved. When, under treatment, the stools having reverted from the loose green type to those with soap formation, the dehydration less, the hypodermoclysis is usually discontinued. When to stop the administration comes largely as a matter of experience. One might possibly produce a salt œdema as one of the effects of administration. In but one case of our series was there a general œdema. The only localized œdema was at the site of injection in the abdominal wall itself, demonstration of which was clearly seen at autopsy, and again as metabolism œdema in one case present in the periorbital tissues.

The next striking effect was in the weight curve. In all but ten cases there was a rise in the weight curve. Those ten cases were out of thirteen which we classified as moribund on admission and in them all that was shown was the initial loss after admission, the babies having died before the next weighing day. Here we may say that the custom on this service is to weigh the babies only twice a week. The gain in weight varied from four to eight ounces at a time depending on the amount of saline administered. This increase in weight was not always maintained, it usually falling to the admission weight or a few ounces above it after the cessation of the administration of the saline. However, it is undoubted had the injections not been given, the weight loss would have been much greater and the prognosis more serious.

The effect on the tissue turgor in the very sick cases was not as pronounced at first as later on when the infants' general condition had improved a great deal. But in those cases where loss of tissue turgor was not marked the effect of hypodermoclysis was readily noticed. The very striking effect upon the dehydration was twofold; 1st, a production of a local œdema at the site, thus doing away completely with the dehydration; and, 2nd, the marked improvement of the general condition of the patient, so that, by the replacement of the fluid already lost, the dehydration gradually disappeared except in those cases which were fatal.

The following is a short summary of the cases upon which these observations were made: A total of seventy-two cases for the series, sixty-five of which were grouped as intestinal, including marasmus or decomposition, acute intestinal intoxication and fermentative diarrhœa. In these the symptoms were all much the same as remarked above. Of these sixty-five cases, sixty were admitted to the hospital with a prognosis of five in ten or less and only five with a prognosis over five in ten. In passing it might be said that a prognosis of five in ten means five chances in ten for the child to get well, this means of roughly estimating the prognosis being adopted on the service. The mortality was 58 per cent. for the entire series of seventy-two cases, but this number included 16 which were moribund on admission, i.e., they died before being in the hospital seventy-two hours. There were three cases of pyloric stenosis suffering with severe decomposition and only brought to the hospital as a last resort, at which time it was impossible to improve their condition whatsoever. Deducting the moribund cases the death rate was only 30·8 per cent. and taking into consideration the condition of the children on admission this is remarkably low for summer cases. It might be mentioned that six of the cases were suffering from bronchitis, bronchopneumonia and blood infections, four of which died.

Five were cases of Pyloric Stenosis, three of which died, on admission four had a prognosis of less than five in ten. One was a case of intestinal infection which was cured—here the dehydration was marked in a fat baby; the response to salines was gratifying.

One case of congenital syphilis, which developed a severe decomposition and secondary anæmia from which the baby died.

In fifty-seven of the seventy-two cases there was need of saline administration on admission. Of the remainder all developed a decomposition while in the hospital necessitating the injection of saline. The intervals were three, viz., twice a day; three times a day and every three hours, all depending upon the indications. The average amount varied from 275 to 350 c.c. daily. This again depended upon the condition of the child. The largest administration was 750 c.c. and the smallest 50 c.c. There was a thermal rise in six cases, five of which were apparently due to distilled water, the other to an overdose—750 c.c. Sixty-two out of the seventy-two cases exhibited a rise in the weight curve. The remaining ten were classified as moribund on admission. In three cases there was obtained a slight local reaction and in none of these, as far as anyone could judge, did this have any deleterious effect on the progress of the case.

REMARKS:

1. The subcutaneous injection of fluid is without danger and in 71 per cent. of the cases there was observed a decided beneficial result.

2. The general indications for the injection of fluid are evidenced by loss of tissue turgor and presence of dehydration, which exists in all infants suffering from diseases which produce rapid fluid losses from the body.

3. The immediate results are evidenced:
   a. By increase in weight, thus overcoming the rapid and frequently fatal initial loss.
   b. By improvement in tissue turgor.
   c. By improvement in the child's general condition.

4. It is essential that the fluid for injection should be prepared from *freshly* distilled water.

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Dr. William H. Welch, professor of pathology in the Johns Hopkins University, and Dr. Simon Flexner, of the Rockefeller Institute for Medical Research, recently sailed for China to study the medical schools and hospitals in that country. The results of their investigation will be published by the China Medical Board of the Rockefeller Foundation.

The Canadian Militia Department has authorized the organization of a Fourth Universities Company for overseas service, which will reinforce the Princess Patricia's Canadian Light Infantry. The company will be recruited under Captain A. S. Eve, of the McGill Contingent of the C. O. T. C.

The First Universities Company, under Captain Gregor Barclay, joined the Princess Patricias some weeks ago. The Second Universities Company was recruited under Captain G. C. McDonald and Captain P. Molson and is also overseas. The Third Universities Company, under the command of Lieutenant F. L. Turnbull, arrived at Plymouth September 13th, last.

THE METHOD OF DEALING WITH TUBERCULOSIS IN THE PUBLIC SCHOOLS OF TORONTO, CANADA

F. S. Minns, M.B.

Toronto

MEDICAL inspection was begun in the Toronto Public Schools by the Board of Education early in 1910. Miss Lina L. Rogers, who while in New York developed the nursing side of Medical Inspection of Public Schools, was appointed Superintendent of Nurses. In the same year two medical inspectors and four nurses were appointed. The work of the medical inspectors and nurses disclosed such serious conditions of health that arrangements were undertaken by the Board to organize a system that would embrace all the school children of the city. In February, 1911, Dr. W. E. Struthers was appointed chief medical officer, and in March, eight assistant medical inspectors, one dental inspector, and thirteen nurses were added to the staff. One year later, February, 1912, six additional nurses, and in March, ten additional medical inspectors were added; in March, 1913, three more medical inspectors and twelve nurses were appointed to complete the medical and nursing staff. Dental rooms were equipped in four schools, and four dental chairs were installed. In April, 1913, two dental surgeons were appointed, and later two more were added. This number of dentists has been increased to thirteen. The present total staff consists of a chief medical officer who gives his whole time to the department, twenty medical inspectors who give their mornings from 9 to 12 a.m., one of whom is a special examiner for tuberculosis, one chief dental officer and thirteen dental surgeons on part time, one superintendent of nurses and thirty-five nurses on whole time.

The city is now divided into districts with a medical inspector and two nurses in charge of each district. The medical inspector and the nurses of each district are expected to obtain an accurate knowledge of the prevalence of disease, sanitary conditions, home environment, and the number of indigent families in the district. The investigation and control of positive and suspect cases of tuberculosis among school children is being carried on with the assistance of the whole staff by one of the assistant medical inspectors specially qualified to undertake this work. The work is being developed in proportion to its importance and magnitude. All known positive cases are recorded and every exposed and suspect child is examined. The medical inspectors and nurses assist the special examiner by referring to him all exposure and suspect cases with a report of home conditions.

Extract from instructions to the staff regarding positive and suspect cases of tuberculosis.

"Cases naturally divide themselves into two classes: First, those without a history of exposure, and second, those with a history of exposure, that is, direct contact."

"All suspect cases *without a history of exposure* must first be examined by the school medical inspector, who, if he deems it necessary, will have a report sent in requesting an examination by the special examiner. Special consideration is to be given cases where an examination is requested by the parent."

"All suspect cases *with a history of exposure* should be reported and a notification will be sent stating the manner in which the case is to be followed up and examined."

"Reports of *all new* cases of suspect tuberculosis, and *all old* cases not as yet recorded with coloured stickers, should be sent in with your daily records, on the form provided. In the event of not having a form, give all the information which is thereon asked for: name of school, family name, address, names of all the children of all ages in the family, present whereabouts and condition, history of contact or exposure, agencies interested, and your signature."

"Cases, which are reported from the office of the chief medical officer and having a history of exposure, are to be examined as soon as possible by the special examiner or at a chest clinic at one of the hospitals or dispensaries mentioned in the notification."

"Cases which are examined by the special examiner or at a chest clinic will have the results of the examinations reported to the medical staff of the school as soon as possible. If the child is advised to discontinue attendance at school, the report will state this, and when advised to return to school after absence the child will be given a note to this effect."

"Cases reported by the special examiner, and no others, are to be recorded by the school medical inspector on the children's reference and physical record card with coloured stickers. These stickers are used according to a code supplied."

"Under the heading on the report, 'agencies interested,' the following are the four principal ones: the parent or guardian, school, family physician, and any recognized charitable organization in the order in which they are to be considered."

"A record of every child examined to determine if tuberculous infection is present is kept in the office of the chief medical officer. In so far as possible the record of each family will be completed under the following heads:

Date of the special examination.

Names of all the children in the family.

Ages of all the children.

Family address.

Name of the school or schools that the children attend.

Brief history of the exposure:—family, house, occupational, time, duration, degree.

Result of the tuberculin test.

Number of the *x*-ray when taken.

Pathological lesions.

Diagnosis, and by whom it was made.

A note as to whether the case has been registered or reported to the Board of Health.

A note stating by whom the child was referred for examination.

A note of the child's present physical condition, and of the home and social conditions.

A note of the recommendations *re* school and treatment.

A note of the termination of attendance or treatment.

"The work of the department is carried on in conjunction with the work of the family physician, dentist, the chest clinics at the hospitals and dispensaries, the various missions, the social service organizations, and the Board of Health. From these sources reports are received and acknowledged. The work is being developed and expanded in harmony with the existing organizations in order to reach the largest number of children possible, and as soon as there is reasonable ground for investigation to bring the timely aid which will ultimately be a great factor in lessening the prevalence of tuberculosis among school children,—conservatively estimated at twenty-five per cent,—and as a direct consequence, among adults."

"Information may be obtained at any time by the members of the staff from these records."

"When the 'agency interested' is a physician the following form letter is sent to him and no further steps are taken in the case until a reply is received."

Toronto................

Dr................

....

Dear Doctor:—

I have received a report that you are interested in the........ family..............St. The report states that the children attending school have been exposed to an infection with tubercle bacilli. We are desirous of gaining some definite knowledge regarding this infection, the control of which is one of the aims of medical inspection of public schools. We ask for your co-operation in one of three ways:—

First:—That you will send a certificate giving your examination findings, and state whether the case shows sufficient signs and symptoms to make a clinical diagnosis in the case of,

...................., age ....
...................., age....

Second:—Or that you will express your willingness to have the children examined at school by the school special examiner, Dr. F. S. Minns, who will send you a report of his examination.

Third:—Or that you will express your willingness that arrangements be made by the school nurse for an examination at a chest clinic at one of the hospitals.

Trusting to hear from you soon in regard to this matter, I remain,

Yours sincerely,

Alex. MacKay,
Chief Medical Officer.

This special work has been carried on for a year and a half. During this time a large number of letters have been written to the doctors. The response in almost every case has been prompt and in all cases a ready will has been shown, to assist in the work in every way. Every doctor has experienced the difficulty of getting permission to examine all exposure and suspect cases which he meets with in his private practice and he has been found to welcome the aid which will enable him to render service to those under his care.

Contagious diseases reported to the Municipal Board of Health from all sources are daily reported by the Board of Health to the chief medical officer. These cases are then reported by telephone, and by mail on special forms, to the principal and to the medical inspector of the school in the district in which the cases live. Cases of tuberculosis reported from the Board of Health, however, are for several reasons forwarded to the school medical inspector only. The school nurse then discovers whether there are any school children in the house with the case. If school children are found a complete record is sent in on the form provided, and where there are no school children a report to this effect is returned. The results of all examinations and the recommendations in each case made by the special examiner are reported to the Board of Health. In the case of tuberculous adults examined at the clinics at the Toronto General, St. Michael's and the Western Hospital, instructions are given to the patient that all the children exposed are to be brought to the chest clinic at the Hospital for Sick Children for examination irrespective of the presence or absence of symptoms of tuberculous infection. The results of the examinations and the recommendations made by the examiners at the hospital are reported to the medical staff of the school which the children attend. The Board of Health and the Board of Education nurses therefore receive the same information about the cases. This tends in a measure to prevent overlapping of medical, nursing, or relief work. Many new cases other than the above are continually being found by the nurses in their work in the school or while making visits to the homes, and these cases are reported to the special examiner.

The examinations made in the schools are arranged by the school nurse who gets a written consent from the parents for the examination. The nurse also endeavours to have the parent present. This is of considerable help in obtaining an accurate history and it insures the prompt carrying out of recommendations. A tuberculin test is made for each child examined,—either a Von Pirquet or a Mantoux.

Cases examined are divided into three groups: positive, negative, and cases of doubtful evidence. Cases in the third group are kept under observation and reëxamined until placed in either the positive or negative group. The positive cases are sub-divided into two groups—open and closed cases. The closed cases are those which have given positive tuberculin reactions with clinical evidences of tuberculosis.

This branch, as are all the branches of medical inspection work, is carried on to help each child of school age to attend school the largest number of days. This is possible for a healthy child only. The natural question which arises is: "What are we doing for the child who is found with signs and symptoms of tuberculosis?" The large majority of them are found to have one or more of the following more common pathological lesions, viz.: sore eyes, defective teeth, discharging ears, enlarged cervical, mediastinal or bronchial glands, diseased bones, joints, or skin, or some pulmonary involvement. Varying grades of anæmia and degrees of debility with frequently recurring colds are common conditions. In many cases treatment of the non-tuberculous conditions is the best treatment for the tuberculous. Parents are advised to take their children to the family dentist. If unable to afford to do so, the children are treated at one of the schools or municipal dental clinics. For ear, nose, or throat treatment, the children are referred to the family physician, or to one of the hospitals. The correction of these defects in many cases is all that is necessary, with the addition of general measures to improve the general health. Tuberculin treatment is advised for suitable cases and is given by the family physician, or at the chest clinic at the Hospital for Sick Children. We endeavour to have open cases among adults removed from the child, or the child from the home. A large number of closed cases are sent to the Preventorium of the Daughters of the Empire for a period of one to four months. Their education is carried on by a teacher provided by the Board of Education while in this institution. The admissions to this institution are granted at the chest clinic at the Hospital for Sick Childern. The child sent to the Preventorium is one who, after repeated examinations, is considered safe to mingle with other children and to be re-admitted to school. During the six warmer months of the year, the Heather Club Chapter of the Daughters of the Empire with the coöperation of the Hospital for Sick Children are able to care for fifty children at the Lakeside Home. During this period the Board of Education also maintains two forest schools, one in Victoria Park, the owner, Mr. H. P. Echardt, having generously given the use of the grounds and buildings for the past two years, and one in High Park, a corner of which is being used with the consent of the city council. The attendance at each of the two forest schools averages one hundred. Inasmuch as the schools are intended for children physically sub-normal and presumably more susceptible to secondary infection, great care is exercised to select such cases only in which infectious pathological conditions are quiescent. Frequently it is necessary to cope with bad environment, poverty and ignorance, and here the agencies of pure air, selected diets and education, are the remedies *par excellence*. Open cases, pulmonary or otherwise, which are a menace to others are excluded from all schools, and the cases, adult or child, among the poor, are visited by the Board of Health nurses. In some instances the children are referred to the Queen Mary Hospital at Weston where there is accomodation for about eighty children.

This method of dealing with tuberculosis as it exists amongst the children in our public schools and the careful study and supervision of the individual child during school life will, it is hoped, produce good results. The statistics obtained, moreover, should be valuable to the medical profession in the general study and prevention of tuberculosis.

THE work of the Montreal General Hospital increases steadily and, since the outbreak of the war, the authorities have been obliged to refuse admission to many applicants. At one time there were as many as 407 patients in the hospital, and in the outdoor department 512 were treated in one day. An electro-cardiograph was added to the hospital equipment some time ago, and a department of massage and remedial gymnastics has been established in the outdoor department in connexion with the School of Physical Education of McGill University. The policy of the Medical Board has always been to encourage the younger men in the profession to become connected with the hospital. The wisdom of such a policy is evident: a large number of those who were on the hospital staff are now on active service but their places have been taken by others already connected with the institution and the work of the hospital has been continued along established lines without confusion.

Case Reports

CHOLÆMIC HÆMORRHAGE

By E. M. von Eberts, M.D.

Surgeon to the Montreal General Hospital

MADAME J., aged fifty-six years, was admitted to the private wards of the Montreal General Hospital on June 17th, 1914, complaining of attacks of abdominal pain, jaundice, and loss of weight.

For five years previously the patient had suffered from attacks of pain in the back, to the right of the median line, and localized at the level of the tenth dorsal spine. These attacks were sudden in onset, and were frequently accompanied by sweating and chills, and on a few occasions by nausea and vomiting. In April, 1914, two months before admission, jaundice developed, and became gradually more intense.

On admission the patient was found to be well nourished. There was universal icterus of a fairly pronounced grade. From time to time there was complaint of pain of a dull aching character at the right costal border. The thoracic organs were normal. The abdomen was prominent, with a very heavy panniculus. Below the costal margin, in the right nipple line, there could be felt a smooth, round, insensitive mass, which moved on respiration and was presumably the gall bladder.

Urine: specific gravity 1·036; acid; no albumin; no sugar; positive reaction for bile.

Tests of the coagulation time of the blood by the drop method showed a normal coagulation time as compared with that of the house surgeon, Dr. Holbrook.

The stools were clay coloured, and contained neutral fat. There was no reaction for bile. The amount of mucus present was not abnormal.

In preparation for operation the patient was placed on a milk diet and given a purge on four succeeding days. One drachm of calcium lactate was given by mouth.

The operation was performed on June 22nd, 1914. After a preliminary hypodermic injection of morphine gr. ¼ and atropine gr.1/150, anæsthesia was induced with nitrous oxide gas, and maintained with ether (open method). The gall bladder was exposed through the usual Robson incision. The palpable mass already described proved to be a process of the right lobe of the liver. The gall bladder was found to be contracted and to be densely adherent at its apex to the liver, and posteriorly to the gastrohepatic omentum. Stones were palpable through the bladder wall. The cystic duct was dilated, and in the common duct there could be felt a large cylindrical stone. After the omental adhesions had been liberated, the cystic duct was ligated at a point of marked thickening and contraction near the common duct, and the gall bladder removed. The common duct was then incised, and a stone, 2½ cm. long and 1¼ cm. in diameter, removed. Two smaller stones were released from the lower portion of the common duct. A drainage tube was then sutured into the opening in the common duct at its junction with the cystic, and a second free tube was inserted beside the common duct drain to provide for any leakage of bile. The wound was then closed in layers.

Convalescence was uninterrupted until the sixth day after operation, when towards evening the patient was nauseated and vomited. A stool passed at this time was dark in colour, and on examination was found to contain blood. Early on the next morning (June 29th) an increase in the pulse rate was noticed; and later, hæmorrhage into the dressings. On examination there was found free bleeding from the lower angle of the wound. The stitches were removed, and the wound opened down to the aponeurosis. One spurting point in the rectus muscle was ligated. In addition to this visible source of hæmorrhage there was oozing from all tissues in the wound, from the muscle, from the fat, and from the margins of the skin. There was no hæmorrahage from either tube. The patient was given coagulose, equivalent to 20 c.c. of horse serum, and one sixth of a grain of morphine; and the wound was packed with gauze soaked in adrenalin. The blood which escaped from the wound showed no signs of clotting. The morphine was repeated every four hours subsequently.

Although much diminished, the oozing from the wound continued throughout the day, soaking the dressings and running down the flank without a vestige of clot formation. Between eight and ten o'clock in the evening it became more marked. A second dose of coagulose was given. The pulse rate had fallen from 100 to 90. At nine o'clock the patient vomited bile, which contained blood.

Death occurred at three o'clock on the following morning (June 30th). There was no autopsy.

In addition to the hæmorrhage from the parietal wound, severe bleeding evidently occurred from the mucous membrane of the stomach and from the intestinal tract.

In a case cited by Whipple in the *Archives of Medicine*, 1912, spontaneous hæmorrhages developed three months after the onset of jaundice, the bleeding appearing in the form of oozing from the mouth, blood-stained vomitus, and bloody stools. Observations upon the coagulability of the blood five days before the onset of hæmorrhage showed but a slight delay in coagulation, a delay which at the time was considered within normal limits. Death occurred three days after the appearance of the first hæmorrhage.

In another case, communicated privately by Dr. Pratt of Boston, cutaneous hæmorrhages occurred over the front of the chest of an individual who had been jaundiced for a period of two months. Death took place two months after the development of the hæmorrhages. At autopsy there was found degeneration of the central portions of the lobes of the liver, with fatty metamorphosis; hæmorrhagic areas in the skin, subcutaneous tissues, pericardium, and peritoneum; and hæmorrhage into the stomach, intestines, and bladder.

In neither of these cases was there any operative interference. In Whipple's case blood examinations after the onset of hæmorrhage showed an excess of antithrombin.

While slightly delayed coagulation time is commonly met with in association with obstructive jaundice, the administration of calcium will, in all but the cases of true hæmorrhagic disease, restore the normal coagulation time. Whipple has suggested that this is due to a binding of the calcium by the bile pigments,—a combination possessing unusual stability. In true hæmorrhagic disease, on the other hand, calcium has no effect. It is highly probable that the causative factor, namely antithrombin, is produced in excess within the liver itself. The various experiments of Morawitz and Bierich confirm the earlier findings of Alexander Schmidt; that, while the bile salts can suppress the development and also the action of fibrin ferments, they must, in order to effect this, be concentrated to a degree which is never met with in the blood; and they conclude that the bile salts circulating in the blood of jaundiced patients do not exert any striking influence upon coagulation. There is a great deal of experimental evidence in support of the belief that the liver chiefly is concerned in the maintenance of the prothrombin-antithrombin balance. For this reason Quincke pointed out that the term "cholæmia" in connexion with hæmorrhagic disease is misleading, and suggested the term "Intoxicatio Hepatica." Pawlov and Bohr demonstrated the absence of coagulation of the blood in animals in whom the abdominal circulation had been isolated. Doyen and his pupils, observing the effects of injuries of the parenchyma of the liver, of phosphorous and chloroform poisoning, and finally of liver extirpation, concluded that the absence of coagulation was due to the injury or disease of the liver itself. Again, Morawitz and Bierich record observations upon cases of obstructive jaundice, and conclude that the delay in coagulation bears no relation to the intensity of the icterus, and that in the majority of such cases coagulability is normal. Blood tests in all of their cases of catarrhal jaundice showed no delay in coagulation time. According to Howell's theory of the mechanism of normal blood coagulation, there is sufficient antithrombin present in normal plasma to bind the prothrombin. Cell injury sets free thromboplastin, which neutralizes the antithrombin. The prothrombin thus unattached combines with calcium to form thrombin, and the free thrombin coagulates the fibrinogen, with the production of the normal clot. Whipple believes that, in those rare cases of true hæmorrhagic disease associated with profound icterus, we may presuppose the presence of some liver disorder which deranges the normal antithrombin-prothrombin balance, and states that calcium has no effect upon this condition. In the treatment of such cases the administration of serum may stimulate an even greater production of antithrombin. The one hope of permanent benefit would appear to be in the practice of direct transfusion.

THE Second International Conference on Race Betterment took place at San Francisco, August 4th, to August 8th, last. Among the speakers were Dr. David Starr Jordan, president of the Leland Stanford University; Professor Irving Fletcher, of Yale University; Mr. Edgar L. Hewett, director of the United States Bureau of Ethnology; Mr. Paul B. Popenoe, editor of the American *Journal of Heredity;* and Dr. J. H. Kellogg, superintendent of the Battle Creek Sanitarium.

TYPHOID CHOLELITHIASIS AND CHOLECYSTITIS

By E. M. von Eberts, M.D.

Surgeon to the Montreal General Hospital

MRS. S., aged forty-eight, was admitted to the private wards of the Montreal General Hospital on January 23rd, 1914, complaining of distress in the stomach, flatulence, and jaundice.

The personal history was negative apart from an attack of pleurisy at the age of twenty-three.

The patient dated the present illness from October, 1912, when she had several slight attacks of pain in the epigastrium, which radiated to the right side and flank along the border of the ribs. The pain in each attack was moderately severe, and persisted for about forty-eight hours. In June, 1913, there was another definite attack; and a third in August, 1913. In none of these attacks was jaundice noted, but in the last the urine is said to have been dark in colour. In December, 1913, several attacks of distress in the epigastrium with cramp-like pain occurred. On December 26th, 1913, jaundice was noticed for the first time, and became progressively deeper.

On admission the patient was fairly well nourished, but had evidently lost weight. The icterus was general and of a moderate grade. The thoracic organs were normal. The abdomen was flaccid and resonant throughout. The liver was palpable at the costal margin in the right nipple line. Immediately to the right of the median line there could be felt a slightly tender mass,—probably the gall bladder.

Radiographic examination showed to the right of the fifth lumbar vertebra a faint circular shadow, about the size of a 25 cent piece, with well defined margins. The radiographic diagnosis by Dr. Wilkins was gall stone.

On January 28th an operation was done. When the abdomen was opened, the mass referred to above was found to be a distended gall bladder. In the cystic duct a large stone, about 2 cm. in diameter, could be felt, but could not be displaced owing to infiltration of the duct wall and the surrounding tissues. The common duct was then opened, and the obstruction was found to be due to a stone protruding from the cystic duct. There were no stones in the common duct. The gall bladder was removed, and the common duct drained. Convalescence was uninterrupted.

On section the walls of the gall bladder were found to be rigid, greatly infiltrated, and friable. The gall bladder itself was filled with creamy pus, and contained three large and innumerable small calculi.

From the pus in the gall bladder and from the interior of two of the larger stones, Dr. Rhea obtained pure cultures of *Bacillus typhosus*. The following agglutinations were done. The patient's serum clumped her own organism and *Bacillus typhosus* from laboratory stock culture in thirty minutes, both in 1-40 and 1-80 dilutions. A known typhoid serum clumped the patient's organism in forty minutes in 1-40 and 1-80 dilutions. An attempt by Dr. Shanks to isolate *Bacillus typhosus* from the stool was not successful.

Apart from the fact that such cases afford interesting evidence of the occurrence of localized extra-intestinal typhoid infections, they are of especial importance owing to the fact that they are typhoid carriers and must of necessity be a menace to the community in which they live. Posselt, in his exhaustive article on atypical typhoid infections, deals with this condition, and reviews sixteen cases of primary typhoid infection of the liver and gall passages from whom no history of typhoid fever could be obtained or in whom at autopsy no other evidence of typhoid (such as lesions of the intestine) was found.

In the case reported, agglutination tests before operation would have enabled one with reasonable certainty to make a diagnosis of typhoid cholecystitis, and in all cases of cholecystitis and jaundice where the causative factor is in doubt, careful agglutination tests should be carried out, and the stools examined for typhoid bacilli.

THERE are now between 1,400 and 1,500 Canadians attached to overseas army medical corps. There are about 5,000 hospital beds in England and an equal number in France that have been provided by Canada, and, at the present time, Canada has five field ambulances, three base hospitals, one stationary hospital, and two casualty clearing hospitals in France, while at the Dardanelles there are at least three hospitals, and a number of Canadian doctors serving in the Royal Army Medical Corps.

Editorial

PAUL EHRLICH

IN the death of Paul Ehrlich, which occurred in his laboratory at Frankfort-on-Main, on August 20th, the world has lost one of its masterminds and one of its most prolific workers. His was a genius that stimulated the science of medicine in nearly all of its varied branches, the results of whose work have made him one of humanity's greatest benefactors. Indeed when one reviews the immense amount of work that owes its origin to his own personal industry and genius, and the long list of publications which have been given to the world as a direct and indirect result of his stimulus, one is even justified in saying that the greatest medical master of the decade has gone.

It is perhaps invidious to make comparisons, nor should one endeavour to place in competitive columns the results of work that have emanated from such authorities as Jenner, Pasteur, Lister, Metchnikoff, and Ehrlich. Yet one feels, in making a mental note of the achievement of these masterminds, that Ehrlich has at least earned a position of equal respect with the very greatest. While it is true that many of his great achievements are as yet the subject of controversy, and that many of his results are no doubt a source of criticism in the scientific world, there is no one in this generation who has so altered the trend of medical thought as Ehrlich.

The line of research which he has initiated in immunity alone has done more to stimulate the study of the cause and prevention of disease than has the work of any other living man, or of most of those who have already passed on.

Throughout his varied achievements is to be observed one dominant idea, viz., the specific affinity between the chemical constitution of organs, cells, and cell-elements and their respective functions. This relationship in its chemical, micro-chemical and physiological aspects, appears in every stage of his life-work as *the* feature that dominates all his researches from his earliest student days.

The inspiration of his cousin and friend, Berger, seems to have been the starting-point of his career. Berger was professor of neurology in Breslau when Ehrlich was still a student and when discussing the affinity of lead for nerve tissues as found in the paralyses of plumbism, Ehrlich developed his first ideas on these lines. It was this stimulus which led to his research on the granulation of blood cells, culminating in the foundation of modern hæmatology. It led further, to his important investigation of bacteriological stains, including the discovery of the acid-fast properties of the tubercle bacillus. Nay more, this same stimulus led to a study of the oxygen requirements of the organism, and later to his observations on intra-vital stains, (e.g. methylene blue), which has added so much to our knowledge of the pathology and clinical aspects of neurology.

This appreciation of protoplasmic affinities stimulated research in organic chemistry, and more especially in experimental work with aniline dyes, which at this time were being used with ever-increasing interest. His results along these lines made him more famous as a chemist among chemists, than as a physician among clinicians. In the course of this work he discovered the mast-cells, and classified the leucocytes along modern lines. Gradually these dominant ideas led to the creation of artificial affinities, and to the newer views of antibodies as incorporated in his side chain theory of immunity,—a field of study which in itself has produced almost a revolution in our understanding of disease. His famous epigrammatic teaching, *corpora non agunt nisi fixata* expressed in characteristic terseness his views with regard to protoplasmic affinities.

In this connexion, too, should be mentioned his standardization of the antitoxine of diphtheria, which made its practical clinical use possible. One step led to another, until finally came his great work on the synthesis of organic substances, an experimental biological study which laid the foundation of modern chemo-therapy and to the discovery of salvarsan.

Thus throughout his career wherever he went, and at whatever he worked, he revealed new ideas, which when conceived allowed new avenues of research for his hosts of students and assistants to develop. Thus were laid the foundations, too, of hæmatology, chemo-therapy, and, in association with Behring, of sero-therapy as well.

So broad was his scope that in perusing his work, one may well wonder if his specialty was chemistry, physiology, histology, pathology or therapeutics and thus he demonstrated to the medical world that progress is only made by and through the experimental sciences.

His genius as an organizer was exemplified nowhere so forcibly as in his masterful handling of 606. In the early days of this discovery, it was of paramount importance that the drug should be tested by those worthy to be trusted. Consequently before appearing in public with any authoritative statement concerning the efficacy or utility of this drug, Ehrlich exercised tireless patience in the collecting of reliable data from those competent to experiment in its use. These data once assembled, he then submitted them to a rigorous reëxamination on the basis of his own profound researches in this field, and having eliminated discovered errors in these reports, he re-drafted the entire series of results giving the drug to the world not only with the authoritative explication of a master, but also the practical directions governing its use by practitioners.

Of his personal characteristics there is much worthy of note. He was gifted with rare combination of versatile genius and highly developed imagination. His exactness was on a par with that of the most thorough-going scientist, while his conscientiousness was ethical to a degree. Above all else in his capacity as an author he possessed the all too rare quality of refraining from rushing into print, deeply convinced of the truth that the prime function of a teacher is to be certain of the facts upon which his thesis is based.

As an index of his attention to detail it may be noted that even in the observations on his animal experiments, he manifested the self-same exemplariness which the physician displays in devotion to the human. It was said of him that in his rounds of the animal house, one instantly compared it to the ward visits of a hospital.

As one would surmise from the foregoing, modesty, simplicity, and entire absence of the dramatic were conspicuous traits of his character. Nor is it too much to say that these graces were no less exceptional than his intellectual attainments

EGYPTIAN OPHTHALMIA

THE presence of a British Expeditionary Force in Egypt at this time recalls to the student of ophthalmology the greatest epidemic of contagious conjunctivitis the world has ever known, as well as the important investigations made by early British oculists in connexion with this outbreak. Incidentally one sees how great have been the strides in medicine during the century that has elapsed, on contrasting the rational measures which now grant immunity to the troops with the complete ignorance on the subject which previously existed.

From the earliest times Egypt has been notorious for the prevalence of contagious eye diseases—a thing to be explained, not probably because of any untoward influence in the climate of the country, but because of the abject poverty, which, with its attendant evils, fell to the lot of the Egyptians under the oppression of their conquerors, and especially since 1517 under the misrule of the Turks.

On July 1st, 1798, Napoleon landed in Egypt with an army of about 35,000. Within a comparatively few weeks a very large percentage of these men were afflicted by a variety of infectious diseases, chief among which were conjunctival inflammations. Eventually two-thirds of the French troops were attacked, and it is not too much to say that these disturbances constituted a deciding factor in the campaign. The British forces, commanded by Sir Ralph Abercromby, were infected almost to a man; and the troops of both France and Britain on their return to Europe lighted up an epidemic of the most frightful proportions during the remaining years of the Napoleonic wars. In 1818 there were more than 5,000 men blind from ophthalmia in the British army. In the Prussian army 20,000 to 25,000 soldiers were affected between 1813 and 1817; and in the Russian army 76,811 men contracted this dreadful malady in the period from 1816–1839. Because the epidemic had had its origin in Egypt, the term "Egyptian" ophthalmia was very often applied during these years to designate the scourge, though it has long been known that for centuries previously the disease had been almost universally endemic.

In 1810 a committee of medical experts was appointed by the British government to consider the best means of preventing and eradicating the malady. The report of these men is one of the classics of ophthalmic literature, stamped as it is by clearness of thought, close reasoning, and lucidity of expression altogether wonderful. They were the first truly to appreciate the infectious nature of conjunctivitis, though the final proof came much later with the work of Piringer; they realized what was also later demonstrated, that the Egyptian ophthalmia consisted of more than one type of inflammation; and we owe to them our first accurate description of the features which we now know to be characteristic of trachoma. The regulations laid down by the committee for the prevention and control of the malady, based as they were upon a clear conception of the disorder, would be judged adequate even at the present time. Owing to the difficulty of enforcing these regulations, however, trachoma persisted for many years at home and in British military stations abroad. Outbreaks occurred at the time of the Crimean War, during the Indian Mutiny, and again under Sir Garnet Wolsey in Egypt in 1882; but in the latter instance only after the conditions following the battle of Tel-el-Kebir made it impossible to observe the precautions that had previously granted immunity. In the South African War trachoma was virtually unknown.

While the scourge of trachoma has been for the most part mastered in Europe, its eradication and treatment still remains one of the great problems of the Egyptian government. As giving an idea of its frequency, one learns that in 1913, out of 2,278 children at one of the state-aided kuttabs 93·2 per cent. were trachomatous, 65 pupils being blind in one eye, and 21 in both. At another station 92·4 per cent. of the 969 pupils were trachomatous, 34 being blind in one eye. The work of combating the disease had its origin in 1903 in a princely gift of £40,000 to the Egyptian government for this purpose by Sir Ernest Cassel. Under the directorship of A. F. MacCallan it is being ably and rapidly developed. To the travelling hospitals originally suggested have been added stationary hospitals and dispensaries in various parts of the country, and great assistance is now forthcoming from the native physicians and nurses who have been especially educated for this work. While the task that has been undertaken is enormous, one can look forward to the time when this scourge will be banished from the land, and Egypt will have, in the economic saving of thousands of heretofore disabled inhabitants, some measure of compensation for the sufferings of the past.

CHOLERA is reported to be prevalent in several districts in Germany; it is said to be most severe in Silesia, and to be present in Wiesbaden, Berlin, Breslau, and Frankfort. In Austria, together with smallpox, it has been in existence for more than a year. The disease is also reported from Riga and Petrograd in Russia. On August 1st, it was stated officially that there were 629 cases of Asiatic cholera in Austria. The prevalence of typhus fever in Austria and Germany is also reported.

THE employment of borsal powder and cresol paste in the treatment of wounds has been advocated by Sir Walter Cheyne. The method, however, has not found favour with medical officers who have tried it at the front. The prevailing opinion seems to be that, in deep wounds, the paste blocks the external exits and prevents the flow of secretions, and that, in slight wounds, the procedure is in no way superior to other methods of treatment.

A MEMORANDUM on the treatment of injuries in war based on experience in the present campaign has been issued by the War Office, though Messrs Harrison and Sons, of London. The volume consists of about 150 pages only. It summarizes the experience gained at the various military hospitals in France and its purpose is the attainment of uniform lines of treatment according to methods based on definite observation and experience at the front As is indicated in the brief preface by Sir Arthur Sloggett, K.C.B., the Director-General of the Army Medical Service in France, the recommendations contained in the volume have been designed to meet the actual conditions encountered in the present campaign. The book is not on sale but is intended for the use of medical officers.

THE foundation stone of the physiological department of the buildings of the Welsh National School of Medicine at Cardiff was laid by Lord Pontypridd on August 12th, last. This building, with the great hall and staircase which are also to be constructed at once, form the first part of the National School. Later on, a department of public health and a school of preventive medicine, together with the necessary buildings for a complete school will be added. The funds for the buildings now under construction have been provided by Sir William James Thomas, who has promised a further sum of £60,000 for the additional buildings on condition that the Treasury made a grant adequate for the administration and maintenance of a medical school worthy of Wales.

Book Reviews

TEXT-BOOK OF FORENSIC MEDICINE AND TOXICOLOGY. BY R. J. M. BUCHANAN, M.D., F.R.C.P., professor in forensic medicine and toxicology, University of Liverpool, eighth edition, revised and enlarged. E. S. Livingstone, Edinburgh, 1915. Price 7s 6d net.

A careful perusal of this edition, the eighth, shows it to be an excellent text-book. It treats in a clear and concise manner the subjects usually found in books on forensic medicine and gives a full, lucid and comprehensive statement of the action, symptoms and treatment of poisons. It is a book well adapted to the student and general practitioner.

PRACTICAL MATERIA MEDICA AND PRESCRIPTION WRITING with illustrations. By OSCAR W. BETHEA, M.D., Ph.G., F.C.S., assistant professor of materia medica, Tulane University of Louisiana. F. A. Davis Company, publishers, Philadelphia.

IN this octavo volume of about five hundred pages the writer has presented us with a brief statement of the more important therapeutic actions of all the officials drugs of the United States Pharmacopeia, with a description of their various preparations and their doses. With each preparation is given several prescriptions for the most part copied from the recent writings of eminent physicians and specialists throughout the States, and minute details are given for their administration; thus enabling the practitioner to prescribe his chosen drug to the greatest advantage. In the last one hundred and fifty pages careful instructions are given on the writing of a prescription, on the choice of a vehicle, and on the avoidance of any incompatibility of the ingredients.

We have carefully examined this book and believe it will be of great value to the student and young practitioner. The illustrations are well selected. The typographical errors are not numerous. A few in which the dosage is at fault require caution, but as a whole we can recommend the volume, and have pleasure in placing a copy in our library for the use of students.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

DISSECTION METHODS AND GUIDES. BY DAVID GREGG METHENY, M.D., L.R.C.P., L.R.C.S. (Edin.), L.F.P.S. (Glas.), associate in anatomy and for some time senior demonstrator in the Daniel Baugh Institute, the Department of Anatomy and Biology, Jefferson Medical College, Philadelphia. Philadelphia and London: W. B. Saunders Company, 1914. Price $1.25.

DISEASES OF THE ARTERIES INCLUDING ANGINA PECTORIS. BY SIR CLIFFORD ALLBUTT, K.C.B., M.A., M.D., F.R.C.P., F.R.S., regius professor of physic in the University of Cambridge. In 2 volumes. Macmillan & Company, Limited, St. Martin's Street, London, 1915. Price 30s. net.

COLLECTED PAPERS FROM THE RESEARCH LABORATORY PARKE DAVIS & COMPANY, Detroit, Mich. Dr. E. M. Houghton, Director. Reprints Vol. 3, 1915.

A MANUAL OF SURGERY FOR STUDENTS AND PHYSICIANS. By FRANCIS T. STEWART, M.D., professor of clinical surgery, Jefferson Medical College. 4th edition. P. Blackiston's Son & Company, Philadelphia, 1915.

TEXT-BOOK OF CHEMISTRY AND CHEMICAL URANALYSIS FOR NURSES. By HAROLD L. AMOSS, S.B., S.M., M.D., DR.P.H. formerly chemist, hygienic laboratory, United States Public Health Service. Lea & Febiger, Philadelphia and New York, 1915.

CANCER, ITS STUDY AND PREVENTION. By HOWARD CANNING TAYLOR, M.D., gynæcologist to the Roosevelt Hospital, New York. Lea & Febiger, Philadelphia and New York, 1915.

Obituary

Major Joseph Lewis Duval, of Carleton, New Brunswick, died in London on August 26th, from acute gastritis. Major Duval was thirty-one years of age at the time of his death. He was born at St. John's, Quebec, and graduated from McGill University. He volunteered at the beginning of the war and joined the First Field Ambulance, C.E.F. with the rank of Captain, but was soon promoted to Major and placed in command of his corps. Major Duval was wounded at the battle of Ypres, when a shell burst close to an ambulance where he was attending to the wounded. The D. S. O. was bestowed upon him for his gallantry and especial mention was made of his daring attendance in the service of the Red Cross. He was invalided to England and placed in the Wimpole Street Private Hospital, where he recovered sufficiently to leave the hospital; but he subsequently had a relapse, which proved fatal. His body was lost on the *Hesperian*. A widow and two children survive him.

Dr. W. R. Hall, of Chatham, Ontario, died August 21st. Dr. Hall was born in Richmond Hill, York County, in 1852. In 1874 he entered the Detroit Medical College and, four years later, received the degree of M.D. After practising for five years, he did some post-graduate work in New York. In 1884, he received the degree of M.C.P.S.O. from Trinity College, Toronto, and went into practice at Chatham. Dr. Hall was particularly interested in public health matters and was for many years medical officer of health at Chatham. He was a member of the Pan-American Health Officers' Association, the Canadian Health Officers' Association, and the Ontario Health Officers' Association, and served as president of the two latter bodies. He leaves a widow, a daughter, and a son, Dr. F. W. Hall, who succeeds his father as medical officer of Dover Township.

Dr. Louis Philippe Tremblay, of Montreal, died at the Hôtel-Dieu on September 7th, in the thirty-second year of his age. Dr. Tremblay graduated from Laval University. He leaves a wife and one child.

Dr. Robert McDonald, of Hagersville, Ontario, died August 14th. He was born in West Zorra, Oxford County, in 1850, and was educated at Woodstock. After teaching for a couple of years, he entered upon the study of medicine and graduated in 1868. He went into practice at Fullerton and, after a few years, moved from there to Hagersville. In addition to being coroner for the county, a position which he held for thirty years, Dr. McDonald was medical officer of health of Hagersville. In 1910, he was elected president of the Haldimand Medical Association. Two daughters and a son survive him.

Dr. Mary Fyfe, of Montreal, died August 30th. Dr. Fyfe graduated from Bishop's College, Lennoxville. She had been in practice for about twenty years.

Dr. James Kidd Simpson, died at Victoria, British Columbia, September 2nd, in the fifty-third year of his age. He was born in Ashton, Ontario, and practised at Juneau, Alaska, for some years.

News

MARITIME PROVINCES

The Colchester-Hants Medical Association met at Windsor, Nova Scotia, on August 27th, under the presidency of Dr. Smith Walker, of Truro. The question of fees was discussed on this occasion and it was decided to increase the present charges.

It is announced that the St. John County sanatorium will be opened some time in November. Dr. H. A. Farris has been appointed medical superintendent.

ONTARIO

Dr. Thomas L. Gray, of St. Thomas, has been appointed official surgeon for the southern division of the London and Lake Erie Railway and Transportation Company. Dr. Ferguson, of London, is the surgeon for the northern division.

The following cases of infectious disease were reported in the province of Ontario during the month of August. Smallpox, 39 cases; scarlet fever, 53 cases, 2 deaths; diphtheria, 118 cases, 5 deaths; measles, 160 cases, 6 deaths; whooping cough, 101 cases, 5 deaths; typhoid, 52 cases, 6 deaths; tuberculosis, 85 cases, 59 deaths; cerebrospinal meningitis, 7 cases, 7 deaths. Total, 615 cases, 90 deaths. In August, 1914, there were 714 cases and 116 deaths.

Captain George Musson, M.D., who is in France with the First Canadian contingent, has been appointed medical health officer of Chatham.

The cornerstone of the new hospital at Hamilton was laid on Friday, September 24th, by Sir John S. Hendrie.

Ottawa is not yet free from diphtheria. In August twenty cases were reported, and from September 1st to 21st, twenty-two cases of the disease were reported. It is thought possible that the disease is transmitted by patients who have been released from hospital and, in order to avoid this, it is proposed to place patients who have been discharged from the Isolation Hospital in a separate building for two or three days under observation before they are finally discharged. The erection of a convalescent home for this purpose is under consideration.

QUEBEC

The annual report of the Notre Dame Hospital, Montreal, has just been published. During the year under consideration 2,464 patients were treated, 1,317 men and 1,147 women. There were 837 ambulance calls. The work of the St. Paul Isolation Hospital has been greatly hampered by the lack of sufficient accommodation; it was necessary to refuse admission to 102 applicants during the past year. The patients who received treatment numbered over one thousand. A new hospital building is now under construction.

Dr. J. A. Leduc has been appointed head physician to the Foundling Hospital of the Grey Nunnery, Montreal, in succession to the late Dr. I. Cormier.

ALBERTA

Dr. R. G. Brett, of Banff, has been appointed Lieutenant-Governor of the province in succession to the Honourable G.H.V. Bulyea. Dr. Brett was born at Strathroy, Ontario, and is a graduate of the University of Toronto.

The annual meeting of the Alberta Medical Association took place at Banff on August 20th and 21st, last. Next year the Association will meet at Edmonton, under the presidency of Dr. T. H. Whitelaw.

ARMY MEDICAL SERVICES

The offer of the Canadian Government to provide a hospital for the treatment of French wounded has been accepted by President Poincaré, and it is announced that No. 4 Stationary Hospital, which is under the command of Colonel A. Mignault, of Montreal, will leave England very shortly and will take up its quarters near Paris. The hospital is equipped to accomodate five hundred.

A number of Canadians are now serving with the R.A.M.C. at the Dardanelles. Many of them are on hospital ships. Among others are Lieutenant W. P. MacKasey, of Halifax; and Dr. Colbeck, of Haileybury, Ontario.

Dr. William Mann, of Winnipeg, is temporary medical officer of the twenty-third reserve battalion, at present stationed at Dibgate, England. Colonel Blanchard, also of Winnipeg, is the president of the permanent board at Moore Barracks hospital; and Major Young is on the staff of the same institution.

Major W. W. Nasmyth, of Youngstown, Alberta, has been promoted to the rank of colonel. He has so far recovered from his wounds that he hopes soon to return to the front; at present he is at Calgary engaged in recruiting and training men for service overseas.

Dr. A. C. Scott, of Indian Head, Manitoba, has been appointed to the medical staff of the Canadian forces in England.

Dr. Ings and Dr. Mewburn, of Calgary, have been gazetted majors in the Royal Army Medical Corps.

DR. J. W. RICHARDSON, formerly of Calgary, has been appointed surgeon-specialist in the Imperial army.

MAJOR CHARLES A. PETERS, A.M.C., of Montreal, has been gazetted lieutenant-colonel. Major Peters is in charge of the military work at the Montreal General Hospital; he saw active service in the South African war.

THE following doctors have joined the Royal Army Medical Corps. Drs. W. F. Kenney and M. A. MacAuley, of Halifax; Dr. Walker, of Truro; Dr. James Henderson, of Regina; Dr. J. H. Birch, of Calgary; Dr. Walt, of Stirling, Ontario; Dr. J. M. Casserly and Dr. J. D. Curtis, of St. Thomas, Ontario.

THE following have been appointed medical officers of overseas battalions: Lieutenant J. Maynard, of Stratford, Ontario, of the 92nd Battalion now encamped at Niagara-on-the-Lake; Captain D. W. Gray, of Calgary, of the 56th Battalion; Captain D. B. Neely, of Humbolt, Saskatchewan, of the 78th Battalion now in training at Sewell Camp, Manitoba. Captain Algar and Watt, of Stirling, Ontario, of the 80th Battalion; Captain J. H. Jones, of Brockville, Ontario, of the 8th Canadian Mounted Rifles, in succession to Captain Membery, resigned; Captain H. J. Stephens, of London, Ontario, of the 70th Battalion.

PROFESSOR IRVING H. CAMERON, of Toronto, has been gazetted lieutenant-colonel.

MAJOR C. E. DOHERTY, of New Westminster, assistant director of the medical supplies for the Canadian Overseas Forces, has returned from London. He will be attached to Militia Headquarters at Ottawa and will superintend the arrangements for the care of Canadian soldiers invalided from the front. There are already about three thousand wounded Canadians in England, most of whom will be in this country before the end of the year.

No. 6 Stationary Hospital, supplied by Laval University, is now up to full strength. The unit has been recruited in Montreal and will probably leave Canada about the beginning of November, previously spending a couple of weeks at Valcartier. The personnel is as follows: Commanding Officer, Lieutenant-Colonel G. E. Beauchamp, Majors J. O. D. LaCroix, J. P. Décarie and Georges

Bourgeois, Captain J. A. Lussier, Lieutenants J. U. Gariépy, J. de G. Joubert, J. E. Lorrain, L. D. Collin, Henri M. DuHamel, and Honorary Lieutenant E. R. LaMontagne, quartermaster.

Lieutenant-Colonel A. E. Ross has been appointed assistant director of medical services of the first Canadian Division.

THE following medical officers recently left England for France with their battalions: Captain A. A. Mackay, medical officer of the 42nd Infantry Battalion; Captain J. S. Jenkins, medical officer of the 24th Battalion; Major C. Laviolette, medical offier of the 22nd Battalion; and Captain J. R. Goodall, medical officer, and Lieutenant N. M. MacDonald, supernumary, of the Fifth Regiment, Canadian Mounted Rifles.

LIEUTENANT H. Hepburn, R.A.M.C., has been gazetted captain. The following lieutenants in the Canadian Army Medical Corps have been gazetted temporary lieutenants in the Royal Army Medical Corps: A. A. Skeels, W. J. Davidson, E. C. Chapman, D. S. Cassidy, B. Volume, T. A. Francis, H. Harvey, G. P. Armstrong, J. T. Bowman, C. Gaviller, J. F. Adamson, F. C. Stewart, J. F. Wood, W. E. Ainley, G. B. McTavish, J. R. Irwin, J. B. Haverson, D. Creighton, G. H. L. Armstrong, J. A. Wellwood, J. F. Sadlier, A. R. Munroe, F. L. McKinnon, D. L. Dick, to be temporary quartermaster, with honorary rank of lieutenant: F. H. Atkins, W. H. Owen, D. H. Macdonald and G. Drummond.

DR. STEWART, of Calgary, who is in charge of Queen's Canadian Hospital at Beachborough Park, Shorncliffe, England, has been given the military rank of major.

A REGISTER of the medical men in the province of Nova Scotia who are available for military service is in progress of preparation by the War Emergency Committee of the Medical Society of Nova Scotia. The members of the committee are Drs. John Stewart, H. E. Kendall, J. G. McDougall, J. R. Corston, and W. H. Hattie.

DR. M. A. MCAULEY, of Halifax, and Dr. Smith Walker of Truro, Nova Scotia, have been appointed to overseas corps and have left for the front.

LIEUTENANT E. L. SOUTTS, R.A.M.C., of Agincourt, Ontario, is attached to base hospital No. 15, Island of Lemnos.

The Militia Department has accepted the offer made several months ago by Dalhousie University to supply a hospital for service overseas. Among the physicians who have volunteered to accompany the unit are Drs. John Stewart, J. G. MacDougall, G. M. Campbell, J. R. Corston, L. M. Murray, E. V. Hogan, and A. G. Nicholls. It is possible that the hospital will go to Alexandria, Egypt.

Dr. J. K. Mossman, of Toronto, recently returned from Serbia. Dr.Mossman contracted blood poisoning while in attendance upon patients suffering from typhus fever and for three months was unable to walk.

CORRESPONDENCE FROM THE SEAT OF WAR

No. 3 Canadian General Hospital, McGill

The following notes are abstracted from letters recently received from members of the staff of No. 3 General Hospital, which is now located "somewhere in France," in the immediate vicinity of four other large general or base hospitals, each of one thousand beds.

The McGill Hospital has been in operation since August 10th, last, on which date it received its two first convoys of wounded soldiers. The work of organization of all details has naturally been extensive. A trainload (or convoy) of wounded comes down to the district from the clearing hospitals at the front nearly every night, or oftener as the case may be, and is distributed in ambulances to the various hospitals. Recently the McGill unit has been receiving repeated convoys of from 100 to 250 patients every second or third night. The rule is that all patients who would be fit for light duty in three weeks must be "evacuated" to England as soon as they can be moved, and batches of wounded are being sent off either in this way or to convalescent camps, or to "base details," every morning, so that in spite of the large admissions, the number in this hospital has not so far exceeded three hundred. The men arrive in many cases severely injured, but their *morale* is said to be splendid. According to their condition on arrival, they are known as "sitters" or "liers." The former arrive twenty-five to thirty in a huge conveyance, the latter on four stretchers to an ambulance. The convoys practically always arrive in the night, anywhere between midnight and four a.m., and the procedure of admission, which is much more elaborate than that in a civil hospital, demands the attendance and activity of the full registrars and admitting staff, who are up all night for this purpose. The "admissions" are made in a large reception tent, fitted with tables. There are four tables, each provided with two clerks and a questioner, where all particulars are accurately taken and recorded, four patients being dealt with at each table at once. They are then passed on to a fifth table where the registrar and two heads of the surgical and medical divisions sit, and where a provisional diagnosis is written out and the patient is assigned and carried off to his ward. In this way some sixty patients can be admitted in an hour, but the remainder of the night is occupied in entering admission cards in the official records, making out reports to headquarters, and "evacuating" suitable cases.

The hospital is well situated on sandy soil, which dries quickly after rain, and it is at present entirely under canvas, with the sole exception of the operating building, a wooden structure walled with a substance known as urolite. This has been erected under the personal supervision of Lieutenant-Colonel Elder, and has been splendidly organized by him. Owing to delay in the delivery of the Canadian ordnance, hospital tents have been supplied by the British Government, and consist of magnificent Durbar tents, part of a presentation made to the War Office by the Beghum of Scopal, and other Indian magnates, and sent out direct to the hospital from India by way of Marseilles. These tents are very large, some of them holding nearly fifty beds, with additional space in the centre for nurses work, and they lend themselves admirably to use as wards, and to being connected up in series. They are all floored and will soon be lighted with electricity. Each tent has an outer shell, and a narrow corridor two to three feet wide runs between this and the inner tent, thus securing shade and coolness in summer, and warmth in winter. The covering of the outer shell is grayish white with a double lining of soft red cotton. The inner tent is also of three layers, the innermost being a soft yellow cotton figured with flowers in a beautifully decorative and truly oriental style, and the tent poles and other wooden fixtures coloured correspondingly. There are said to be fifty-two of these larger tents and the appearance of the whole is palatial and really luxurious as well as picturesque. During the coming winter officers and men are expected to remain under canvas, but huts will probably be erected for the more serious sick cases and for the nurses.

The hospital has again its full contingent of nurses many of whom were at first scattered, chiefly for instructional purposes, but have since been restored. A large number of its "fifth year students" (graduates of 1915) have accepted commissions in other military hospitals. With this exception the medical and surgical staff with which it sailed from Montreal is practically intact and all are said to be well, and are deeply engaged in loyally carrying out the noble purpose of alleviating the terrible sufferings of the war, and of returning the wounded soldiers who are capable of recovery to their duties at the front.

Of the other large hospitals in the immediate vicinity of this, one is No. 1 General Hospital under Drs. Finley, Maclaren, Brown, and Mackenzie Forbes, and another, lying directly beside the McGill Hospital, is the Harvard Unit. This is made up and officered entirely by representative men from Harvard University, with the sole exception of the Commanding Officer and Registrar, who are naturally British regulars of the Army Medical Corps, the American officers thus carrying on the medical and surgical work while discipline and returns are carried out entirely by the British officers. The Harvard staff are there for a period of three months, and are then replaced by others from the same school.

Correspondence

THE LATE PROFESSOR A. W. H. LINDSAY, OF HALIFAX

To the Editor,
CANADIAN MEDICAL ASSOCIATION JOURNAL:

SIR,—If you will kindly grant me space I should like to add something to the obituary notice, in your August number, of my friend the late Dr. A. W. H. Lindsay. I may confess that I was so much affected by the sudden tragedy of his death that I found myself unable to write, as I felt I ought to do, some account of him for the JOURNAL. It may not always be wise for an old and intimate friend to attempt this task. The aching heart and sense of loss make it difficult to write, with a proper sense of detachment, of those characters and qualities of our vanished friends which have an interest for those outside the circle of personal friendship. But as the days and weeks go by I realize more deeply the loss which our profession has sustained in the death of Dr. Lindsay, and the remarkable tributes of affection and regard for his memory which have come to me from all parts of the Dominion and from former pupils in our hospitals at the front, impress me with the feeling that something more should be said in the JOURNAL of him and of his work. The great loss to the University of Dalhousie is, no doubt, of greater import to us here in the Maritime Provinces than in other parts of Canada, and yet his influence is not confined to this province. There are many old students of this school scattered over the whole Empire who remember to-day with gratitude and affection the zeal, patience and thoroughness with which Dr. Lindsay devoted himself to his duties as professor of anatomy. And I should like to say to them through the medium of the JOURNAL, that if they feel disposed to act on the suggestion made to me by more than one old Dalhousian that some memorial of their professor of anatomy should be instituted in the university, I shall be glad to hear from them. Perhaps a medal to be awarded as a prize in the class of anatomy would be a fitting memorial.

Dr. Lindsay's services to his university were not confined to the chair of anatomy. He was devoted to the interests of the medical school, through all its vicissitudes. Indeed, as assistant to the professor of chemistry, the late Professor George Lawson, he took part in the first year's work of the school, in 1868. He played a prominent part in disproving the ill-founded aspersions of the "Carnegie Report," and in the negotiations which restored the medical school to its original home in the university; at the time of his death he was secretary of the medical faculty, and I agree in the opinion of an old graduate, now holding a prominent position in the west, that our medical school "has lost her very best friend and ablest worker." No one since the founding of the school has devoted so much time, and thought, and energy to its work and welfare as Dr. Lindsay.

To many members of our profession Dr. Lindsay was best known as the registrar of the Provincial Medical Board and an authority on all matters of medical education and legislation. He was elected registrar in 1885 and was unanimously reëlected in each succeeding year, for thirty years. He conducted the duties of this important office in a way which won the confidence and admiration of the Board, and proved him to be possessed of business abilities of a high order. The records of the Board in their precision, their exactitude, their scrupulous attention to the minutest details, are a testimony to the conscientious devotion with which he did his work. For several years, indeed, he may be said to have acted as an adviser to the Board, for he had made a careful study of medical legislation in the different provinces of Canada and in Great Britain, and had an intimate knowledge of the educational requirements of medical schools throughout the English-speaking world. He had much to do with the late General Wimborne Laurie in securing the amendment to the Medical Act (Great Britain) by which Nova Scotia secured reciprocal registration in the United Kingdom. This special knowledge made him a valuable member of the Medical Council of Canada. To him and to Dr. J. S. Gray, registrar of Manitoba, the Council assigned the important task of revising the first draft of the rules and regulations of the Council and the consideration of its plan of examinations.

The loss of his nephew, Professor M. A. Lindsay, a young man of great promise, in the wreck of the *Empress of Ireland*, was a severe blow to Dr. Lindsay. In a very real sense, it broke his heart. Angina developed. It was only by a great effort and at the cost of much physical distress that he discharged the duties of his chair last winter. He himself was quite well aware of his critical condition. And, at the annual meeting of the Board on the evening of July 21st, the end came with startling suddenness. recalling the tragic circumstances of John Hunter's death.

Dr. Lindsay was a man of unusual mental ability. He took his B.A. degree at Dalhousie in his nineteenth year and in 1875 graduated in medicine. In the following year he went to Edinburgh and in one annus medicus he passed the three professional examinations required at that time and graduated M.B., C.M. in August, 1877. In addition to reading for these examinations he took out several classes, carried off two class medals, acted as assistant in the class of practical pathology and held an appointment in the wards of Professor Lister.

He was a man of a retiring disposition, averse from public appearances and only those who were his intimate friends had knowledge of his sterling character, his deep convictions, his affectionate nature and his admirable sense of humour. A conscientious devotion to duty was the keynote of his life. In the words of his old friend and colleague, Dr. D. A. Campbell, he was "the nearest approach to perfection of any man I knew."

JOHN STEWART.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Western Medical News, May, 1915:

War notes	T. A. Malloch.
A few remarks on antitoxin treatment .	J. W. Turnbull.

The Western Medical News, July, 1915:

The contrast between the surgery of the Civil War, and that of the present war	W. W. Keen.
Roentgen ray as an aid to diagnosis in abdominal conditions	D. S. Johnstone.
Hemorrhagica neonatorum . .	T. W. Sutherland.

La Clinique, August, 1915:

Corps étrangers articulaires d'origine interne siégeant dans les articulations sinon saines du moins ne présentant pas de lésions grossières . . .	A. P. Heineck.

The Public Health Journal, June, 1915:

Refuse destruction	R. O. Wynne-Roberts.
Supervision of communicable diseases in the smaller communities . .	H. W. Hill.
Symposium on cancer, Academy of Medicine, Toronto. Introductory remarks	C. J. O. Hastings.
What the physician can do towards the prevention of cancer	G. Chambers.
Observations on the prevention of cancer from the surgeon's standpoint . .	A. Primrose.
The attitude of the gynæcologist to cancer.	F. A. Cleland.
The attitude of the surgeon to the prevention of cancer	H. A. Bruce.
The Chinese laundry in Winnipeg . .	A. Officer.

The Public Health Journal, July, 1915:

Administration of the Toronto Department of Public Health . . .	H. L. Brittain.
The death rate of British Columbia . .	W. G. Home.
Tuberculosis problems from a public health standpoint	D. A. Craig.
Early diagnosis of tuberculosis . . .	D. Townsend.
Sanitation of camps	A. Paull.

The Public Health Journal, August, 1915:

Administration of the Toronto Department of Public Health, II . . .	H. L. Brittain.
Milk supply in relation to tuberculosis in Ontario	J. Race.
Some of the troubles of a rural medical officer of health and their remedy .	M. Powers.
The playground attendance and the playground director	H. S. Curtis.
Military sanitation as applied to farms .	V. F. Connor.
Sanitation of camps	A. Paull.

Medical Societies

WEST ELGIN MEDICAL SOCIETY

A meeting of the West Elgin Medical Society was held at Port Stanley, Ontario, August 19th, under the presidency of Dr. Walker, of West Lorne. About thirty-eight doctors were in attendance. The principal feature of the meeting was a discussion on pneumonia, in which several of those present took part. The visiting physicians were afterwards entertained by the society.

HURON MEDICAL ASSOCIATION

A meeting of the Huron Medical Association was held at Exeter, Ontario, September 8th, under the presidency of Dr. Kennedy, of Wingham. Papers were read by Dr. Hadley Williams, of London; Dr. A. T. Emmerson, of Goderich; and Dr. W. E. Gallow, of Goderich. It was proposed that county medical associations should be affiliated with the Ontario Medical Association. The matter will be discussed further at the next meeting of the Association.

CANADIAN PUBLIC HEALTH ASSOCIATION

The fourth annual conference of the Canadian Public Health Association, which was held in Toronto on Friday and Saturday, September 3rd and 4th, was in point of interest and value second to none. The conference consisted of five general sessions, all of which proved to be most instructive. The advantage of these general sessions afforded those attending an opportunity to hear all the papers read and discussed, a chance which was much appreciated.

The first paper presented on Friday morning was that on "Modern methods of sewage disposal," by George W. Fuller, consulting sanitary engineer, New York City. Dr. Fuller in this paper summed up the advantages and disadvantages of the various methods. Special reference was made to the activated sludge system. The discussion was opened by T. Aird Murray, of Regina, Saskatchewan, who described the experimental plant that they had installed on this principle in Regina. Later in the morning a paper was presented on the "Control of municipal and industrial wastes," by I. S. Osborne, by whom the subject was handled most ably, the advantages and disadvantages of the destructive method and also the reduction method of waste disposal being considered. Professor George Phelps, formerly of the Engineering Department, Harvard University, and now connected with the International Waterways Commission, presented an address on the work of this Commission, in which he briefly summarized the work that the Commission had accomplished in its efforts to control the pollution of the various international waterways.

On Friday afternoon the conference was held in the theatre of the Toronto General Hospital, when the diagnosis and care of the feeble-minded was considered. The clinic as presented by Drs. Clark, Withrow, and Hincks was of special interest, as many cases were shown demonstrating the different phases of the mentally defective from the idiot to the moron. Papers were presented on the education of the feeble-minded by Dr. Helen MacMurchy, and Dr. E. H. Young, of Kingston, and on the "Immigration of the feeble-minded," by J. D. Pagé, of Quebec.

On Friday evening the President's address by Dr. M. M. Symour, Commissioner of Health, Saskatchewan, was given. Dr. Seymour's illuminating address embraced the various phases of Public Health Work, and the various lines of progress in the field of preventive medicine. He also pointed out weaknesses and fields of action that had been more or less neglected, and endeavoured in this way to strengthen the weak points. Following this was a very instructive illustrated address on "Practical methods of obtaining pure milk," by Dr. Charles E. North, consulting sanitary expert of New York City. This was listened to with intense interest. Dr. North presented in this address the fact that sanitary milk with a low bacterial count can be procured by absolute cleanliness on the part of the producer, without any frills. He particularly emphasized the point that the great factor in the production of clean milk was the man himself, but that no milk was safe without pasteurization

Saturday morning was devoted to the housing problem. A visit was made to the housing scheme of the Toronto Housing Company, where the members of the conference had an opportunity of seeing for themselves the possibility of combining æsthetic taste with usefulness and utility in homes at a moderate rental. A paper was presented on "Housing conditions in Canadian cities," by Dr. P. H. Bryce, Chief Medical Officer for Immigration, Department of Interior, Ottawa, and also papers on "A housing experiment at Toronto," by Mr. G. Frank Beer, chairman of the Toronto Housing Company, and the "Effects of town planning in improving housing conditions," by Mr. Thomas Adams, Town Planning Advisor, Commission of Conservation, Ottawa. These papers were listened to with very great interest and covered most phases of the problem. A free discussion followed in which Dr. Evans, of Chicago, took an active part.

The Saturday afternoon session was devoted largely to Medical Social Service. The first paper presented was on the "Control of venereal diseases in municipalities and military camps," by Dr. W. A. Evans, of Chicago, and the discussion was opened by Lieutenant-Colonel. F. W. Marlow. The second paper was "Notification of venereal diseases," by Dr. J. A. Hutchinson, Westmount, Montreal. This was followed by a paper on "Health and charity," by Professor S. M. Gunn, Secretary American Public Health Association, which was followed by a paper on "Notification of tuberculosis," by Miss Dyke, of the Department of Public Health, Toronto. A very interesting discussion followed this symposium, in which different members outside of the city, as well as in the city, took active part.

In the evening many members of the conference were entertained at the Canadian National Exhibition.

The officers elected for the ensuing year were: Dr. Peter Bryce, Chief Medical Officer for Immigration, Department of Interior, honorary president; Dr. Charles J. Hastings, Medical Officer of Health, Toronto, president; Dr. J. D. Pagé, Quebec, vice-president; Dr. Porter, Toronto, treasurer; Dr. Oswald Withrow, Lumsden Building, Toronto, secretary.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE seventeenth regular meeting of the society was held Friday, June 4th, 1915, Dr. F. A. L. Lockhart, vice-president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

1. The first specimen is a typical scirrhus cancer of the breast removed by Dr. Garrow, which I exhibit because, by this special method of staining "en masse" by scarlet red, it shows exceedingly well the seat and the progress of the cancer. If one stains fat with Sudan or scarlet red, the fat takes, as you know, the red stain tenaciously while other tissues reject it or are easily decolourized. You can see that all the fat tissue of the breast, which makes up the bulk of the organ, assumes the scarlet red stain, while all the carcinomatous tissue has practically remained unchanged white. It needs very little other explanation; the main bulk of the tumour rests well within the red fat tissue of the breast and progressing from the main tumour mass you see the strands of white fibrous carcinomatous tissue invading the surrounding fat tissue of the breast and growing beyond it. If one looks at it carefully one sees that, in the main, the cancer extends between lobes or lobules of fat tissue, apparently following interstitial lymphatics. In this way an almost crab-like appearance of the tumour is produced, so that the name cancer seems extremely well applied.

2. Gun-shot wound of the brain. The patient was an old man who in despondency committed suicide by putting a revolver in his mouth and discharging a twenty-two calibre bullet through his palate. It went up through the roof of the mouth, entered the base of the brain, in the frontal region to the left of the olfactory bulb, running immediately outside of the lateral ventricle, then

crossed the white matter to the cortex, producing a pial hæmorrhage and finally lodged within one of the frontal convolutions, where it rested and was found at autopsy.

3. Tuberculous meningitis with tubercles in left posterior cerebral artery. Usually the tubercles are abundant in the pia arachnoid at the base of the brain, where they are associated with characteristic gelatinous exudate. In this particular case there is found in addition a somewhat rarer finding: several very definite tubercles in the wall of the posterior cerebral artery. The specimen shows very plainly two small tubercles situated in the wall of the artery itself. This Circle of Willis is also interesting from the anatomical stand-point, because it shows an anomaly of the anterior communicating artery; there are two anterior communicating arteries with anastomosis between them.

CASE REPORTS: A series of unusual surgical conditions, by Drs. A. T. Bazin and J. Scott.

In the absence of Drs. Bazin and Scott, Dr. L. P. McHaffie read the case reports, as follows:*

1. Case of volvulus of the small intestine in a new born infant.

2. Hour-glass contraction of the stomach, due to traction from an umbilical hernia.

3. Double inguinal hernia in a marantic infant.

DISCUSSION: Dr. W. M. Fisk. In connexion with this last case I might say that the child was a premature infant, born at the seventh month (labour induced on account of the mother's condition) and weighed three and a half pounds. From the first there was noticed on the right side some prominence in the right inguinal ring. The baby cried a great deal from birth. He was brought up on the bottle and had a great deal of vomiting and apparent distress. At three and a half months there developed an inguinal hernia. I put on a soft rubber double truss but was unable to keep the hernia in place. The child cried constantly, was very small and thin and at five and a half months weighed six pounds. On August 22nd, at five and a half months of age, Dr. Bazin operated to try to relieve the condition. The left hernia was the sigmoid, reducible, the right showed an elongated mass which was tender to pressure and proved to be the cæcum and appendix, the latter being firmly adherent to the sac and irreducible. Recovery from the operation was uneventful and the child lived to be one year old, was greatly improved and weighed eleven pounds. At this time, however, he contracted broncho-pneumonia from which he died.

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* Published in the August number of this JOURNAL.

Papers: (1) Pressure paralysis, (traumatic) by Dr. D. A. Shirres.

The following is a synopsis of the address by Dr. Shirres on this interesting class of paralyses, as illustrated by cases occurring in his hospital practice during a period of two or three months.

1. *Peripheral Nerve Paralysis*—(a) musculo spiral (Saturday night paralysis), (b) circumflex (shoulder dislocation), (c) circumflex and musculo spiral (shoulder dislocation), (d) double musculo spiral (crutch paralysis), (e) wrist-drop (chloroform anesthesia), (f) wrist-drop (tourniquet round forearm), (g) ulnar paralysis (wound in wrist), (h) sciatic (obstetric paralysis), (i) foot-drop (plaster bandage), (j) birth palsy.

2. *Spinal Cord Paralysis*—(a) monoplegia, (Tbc. tumor of cord), (b) paraplegia (endothelioma), (c) paraplegia (Pott's Disease), (d) paraplegia traumatic (fracture dislocation).

3. *Cerebral*—(a) hemiplegic, blood clot, traumatic, (b) hemialegic, blood clot, arterio sclerosis, (c) wrist-drop, hæmorrhage, prterio sclerosis.

Peripheral. Etiology: Pressure or trauma to peripheral nerve, leads to more or less disorder of movement, sensation, reflex excitability, vasomotor and trophic functions. The effects of pressure differ only in degree; results may be transitory or permanent disturbances. Explanation of what takes place pathologically. Myelin sheath, axis cylinder. Regeneration, following pressure upon or division of a nerve. Electrical excitability of (a) nerve, (b) muscle. Symptomatology: Mixed nerve, (a) motor functions constantly affected,—paresis or paralysis, flaccidity, diminution or absence of tendon reflexes, atrophy, electrical changes and loss of electrical sense. (b) Sensory, paresthesias. Injury of a mixed nerve gives rise almost constantly to paresthesias and often to pain. These occur especially when the nerve is incompletely divided or the pressure is not severe enough to obliterate function, (numbness, pins and needles, clumsiness). Anesthesia, by no means constant and if present limited in area; anastomosis, sensory fibres are more capable of resistance and regeneration. Integrity of a few fibres suffice. Objectively, sense of cold and pressure suffer first, warmth and pain subsequently. (c) Vasomotor, skin red, smooth, glossy and tender, local rise of temperature, trophic disorders of bones and joints. (d) Secretory, hyperidrosis or anidrosis.

Course, depends upon severity. Treatment, transplantation.

Prognosis, determined by condition of electrical excitability.

Spinal, (a) Alfred Allen's experiments on trauma of the cord.

(b) Effect of tuberculin in a case of tuberculosis of the human cord.

(c) Description of diagnosis and *operation on a case of tumour of the spinal cord successfully removed, May*, 1914.

Pressure may produce partial or complete paralysis—(a) partial pressure: (1) motor paresis, muscles spastic, hypertrophied, reflexes increased, no electrical change; (2) sensory, may not be disturbed: (b) complete pressure, (1) motor paralysis, flaccid muscles, reflexes lost, no electrical changes; (2) sensation abolished.

Treatment. Remove the cause. *Report on first known successful case of transplantation in spinal cord* (own case).

Cerebral. Hemiplegic or diplegic, motor and sensory symptoms same as spinal.

Treatment. Operation.

Discussion: Dr. G. S. Mundie. This paper has interested me very much because it is along my own line of work. I have had several cases of this pressure paralysis. In one, a young lady who had a fracture of her forearm, who had had a tourniquet applied above the elbow, it is now three months since the operation and she is only beginning to show a restoration of muscle function. Another case had paralysis of the ulnar nerve after dislocation of the elbow. Dr. Shirres has brought the conditions before us clearly, showing the anatomy and pathology of such conditions. Ballance and Purves Stewart have written and appeared to prove that regeneration does take place in a severed nerve. However, the Continental workers, especially in Italy, have not accepted this view and it is still a debatable point whether regeneration does take place from the axis cylinders growing down into the distal end or from the cells of the neurilemma sheath. The concensus of opinion is, I think, more in favour of the axis cylinder theory that they grow down from the nerve into the distal end. Of course, it is a hard thing to prove definitely and it is very hard when you have a patient come to you who wants to know definitely how long the nerve is going to take to get well and you can tell only proximately. One case of a man stabbed in the wrist, when the median nerve was severed, was sutured up and in six months he got back his power of sensation, but it was twelve months before he began to have any motor power at all. It is generally said that a nerve grows about 1 mm. a day.

Another thing I was glad Dr. Shirres pointed out was about the electrical sense; I have noted this in practically all my cases. His report of the transplantation of the spinal cord is certainly very interesting and his advice to operate at once on all traumatic cases of the vertebral column is certainly one I think should be followed that no time may be lost. It is not a serious operation and in competent hands can be done very easily.

Dr. N. Viner: I would like to call attention to a class of cases which might be called "sub-neuritic," cases in which the pressure on the nerves is not great enough to cause severe pain or serious weakness, or to present the "reaction of degeneration," trophic changes in the skin, or to cause a diminution of the "electrical sense." Such conditions may be present anywhere but we see them in the greatest frequency in pregnancy and in pathological conditions, such as tumours, inflammations, in the pelves of men or women. In such cases it is generally difficult to make a definite diagnosis of neuritis, but in view of the more or less continual stabbing pains, pins and needles sensation in tips of toes or fingers, the pains in the thighs or legs of pregnant women, we are justified in coming to that conclusion.

On the other hand there is a series of conditions, which are not neuritis, yet which on account of similarity of symptoms require differentiation. Symptoms such as the above, for example, may be found in various degrees of Raynaud's disease. Again women, particularly when approaching the menopause, who do much scrubbing, or have their hands a great deal in hot and cold water, often suffer in a similar manner. In this latter condition, which is termed "acroparæsthesia," pins and needles sensations and pains in the hands are very common.

Since our views in regard to regeneration of cut nerves are still in the domain of theory, perhaps I may venture a theory too. Dr. Mundie has just remarked that sensation may return at six months, while motion may not return for a year. The disparity in time of the return of the two functions is a common observation of every neurologist. Why then shall we not assume that regeneration of sensory and motor fibres takes place in opposite directions to correspond with their structure, arrangement, and function —that is, sensory fibres regenerate from periphery to centre, from skin to spinal cord, motor fibres from centre to periphery, from spinal cord to muscle, etc. The sensory and motor neurones are laid alongside each other but in opposite directions; they function and possibly grow in opposite directions—why may they not regenerate in opposite directions?

Dr. A. H. Gordon: Dr. Shirres' remarks on the absence of reflexes when the cord is completely severed are most interesting. This thing has on many occasions troubled me and I would like to ask if there is yet any explanation of the fact that in the human being it is the case that on complete division of the spinal cord the reflexes below the division are absent, whereas in animals—dogs for instance, severance does not give rise to such conditions. It seems to me there has never been any completely satisfactory explanation of the difference in the reaction to spinal injury in the human and in the relatively lower animals.

Dr. D. A. Shirres: With regard to Dr. Gordon's remarks it is unanimous to-day that transverse division of the cord is a flaccid paralysis; in animals, dogs and monkeys, transverse division is a spastic or increased reflex condition, the very opposite. In one case of a newly born child who through some accident had a division of the spinal cord it was spastic but in a fortnight was flaccid showing that the new born child is very near the animal. Faradic excitability is not present in a child till six or seven months of age. The reason for the flaccid paralysis in man is that nerve action must be continuous; in the dog it is not necessary, you can divide it and still they live and exist, and in the still lower animals—the worm—you know how that can be divided again and again. There are quite a number of those patients who complain of pain, sensation of pins and needles and numbness with no motor enfeeblement, no sensory anæsthesias and no electrical disturbance and it is hard to come to a diagnosis as to whether it is neuritis or not. But I have no hesitation in saying that it involves an irritation of the nerves. Head is quoted as saying that the Almighty provided a wonderful circulation as to anastomosis and he feels that He also provided the sensory nerves with anastomosis and also a motor anastomosis. There must be some explanation for these cases of regeneration. Stewart gives beautiful photographs of regeneration in the peripheral end and my own feeling is that this is right.

2. Patent foramen ovale, illustrated by two cases: Specimens and lantern slides, by Dr. Maude E. Abbott.

Discussion: Dr. J. A. Henderson. I should like to congratulate Dr. Abbott on the splendid, clear and interesting way in which she has brought this subject before us to-night; it was this particular paper which brought me to the meeting. There is very little can be added in the way of discussion and we have learned a great deal. On looking over the material in the dissecting room at the college I found that we had not come across a single case of patent foramen ovale during the session just passed; in the previous session we found two cases. In one of them there were two comparatively small openings, each rather larger than the size of a match; the other one was quite a considerable size, almost half an inch in diameter and apparently had been pretty well patent all through life though the subject was an old man. The valvular form of patent foramen is rather frequently found in the dissecting room but there is patency only when a probe is passed through and under all ordinary circumstances no intercommunication of blood takes place. I think the point Dr. Abbott brought out in the first specimen very well taken. I do believe we have been inclined to lay too little stress upon the effect of pressure. At the time of closure there is merely a very slight difference in pressure between the right and left sides of the heart and it is quite apparent that if this pressure balance were disturbed it would be easy to have a patent foramen ovale as Dr. Abbot so clearly showed in the first specimen.

Dr. N. Viner: I would like to ask in connexion with the clinical histories quoted by Dr. Abbott whether this condition has anything to do with the early menopause mentioned.

Dr. W. S. Morrow: I feel that none of us here are in a position to discuss congenital anomalies of the heart with Dr. Abbott. She is recognized, not only in Montreal, but in the medical world generally as an authority on this subject and we need not be ashamed to confess our relative ignorance. The most important practical lesson that I have drawn from her paper is the fallacy of the current idea that one has to look for signs of congenital abnormality of the heart only in cases of blue baby and other forms of cyanosis. I will try in future to consider the possibility of congenital anomaly being present in obscure cases of heart disease even in the complete absence of cyanosis. One curious little point in connexion with the second case was that Dr. Abbott spoke of a presystolic thrill and murmur in association with auricular fibrillation. Presystolic has come to be associated in our minds with auricular systole. As we have no effective systole of the auricle in cases of fibrillation we do not usually speak of the thrill and murmur as presystolic but rather as early, mid, or late, diastolic, as the case may be.

Dr. D. H. Bernstein: Dr. Abbott's paper is of particular interest to me at present. During the last few months we had two cases of congenital heart disease in children at the Herzl Dispensary, while in my own practice I came across one case five years ago. Of these three cases one was a case of pulmonary stenosis and the other two I think were cases of patent foramen ovale. Of the two cases of patent foramen ovale one patient is now over five years old. The murmur, in this case, has completely disappeared and the child is practically normal. The other case has only been under observation at the dispensary for about six weeks.

The patient who is now five years old is the more interesting. I confined the mother, a primipara, on April 11th, 1910.

Labour was normal. The baby weighed four pounds at birth. On account of the small size of the child I examined him very carefully on the eighth day and I found a systolic murmur at the base of the heart, most marked at the pulmonary region. The complexion was dark but I did not think that it was cyanosed. The baby was breast fed and did well for about six months. At six months he had an attack of convulsions lasting about two weeks with daily recurrences. Signs of rickets made their appearance about this time with extreme craniotabes. There was hardly any ossification of the bones of the skull. The child was breast fed eighteen months, with cow's milk from the milk station added after the twelfth month. He began to walk at two years of age and cut the first tooth at the age of two. He was a constant sufferer from bronchitis. The cardiac murmur persisted until about two years of age. I saw the child yesterday and I found hardly any sign of rickets while the murmur has completely disappeared. This boy was also treated for some time in the out-door department of the Royal Victoria Hospital.

The other case of patent foramen ovale was brought to the dispensary on March 31st, 1915. H. L., female; aged six months; mother complained that the child had suffered from bronchitis from birth. On examination a systolic murmur was heard over the pulmonary area, no cyanosis. Child born at full term, breast fed, is markedly rachitic and aside from bronchitis had no other illness. The case is still under observation.

Dr. M. E. Abbott: I would like to thank Dr. Henderson for his kind remarks and appreciation of my paper. As to Dr. Viner's question the early menopause occurred only in the second case in which there was true arrest of development. It is well known that in cases of arrest of development of any kind menstruation is apt to set in late and leave early, just as we noted in our case. In the other patient menstruation began at thirteen and was normal till the last nine months of life; the patient died of advanced nephritis and throughout was an extremely chlorotic subject, which explains the termination of the menses in the last nine months of life.

With regard to Dr. Morrow's remarks as to the absence of cyanosis, that is one of the fallacies of medicine, namely, that patent foramen ovale means blue baby. We have a number of specimens of interauricular septal defect in the museum and in not one of them was cyanosis mentioned in the clinical history, except perhaps at the termination of the case. As regards the value of positive venous pulse as a diagnostic sign in these cases, of course that does not apply to cases of mitral stenosis with auricular fibrillation but to cases of mitral insufficiency with no fibrillation.

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MEDICAL IDEALS IN THE ANCIENT WORLD

The Opening Lecture of the 84th Session of the Medical Faculty of McGill University

By Professor J. Playfair McMurrich

University of Toronto

I DESIRE first of all to give an expression, necessarily imperfect, of my appreciation of the honour you have conferred upon me in inviting me to deliver the opening address of this eighty-fourth session of the Medical Department of McGill University. It is indeed a two-fold honour, for it is an honour to be invited to speak in the halls of a faculty which has so long and so splendid a record of progress and accomplishment as the Medical Faculty of McGill. And it is again an honour, more than personal, that I should be invited as a representative of a sister faculty to inaugurate your session of 1915-16. I may, I am sure, assume that your invitation is a testimony to the sincerity of the mutual esteem and amity which govern the two universities in all their relations, and an earnest of the continuation of friendly coöperation in all matters pertaining to the progress of medical education in Canada.

I desire also to congratulate the Medical Faculty and students of McGill on this splendid building, so well adapted to its purpose, so bountifully equipped, and withal an architectural ornament to the university, which may justly be proud of it. Truly those of us who are less sumptuously housed may be pardoned if with difficulty we suppress some feelings of that uncharitable emotion, envy, but we can suppress them because we know from past achievement that McGill has both teachers and students who will fully utilize their opportunities. Could the members of that small but enthusiastic group who in 1823 founded the Montreal Medical Institution but "revisit the glimpses of the moon", with what satisfaction would they regard their offspring now grown to maturity, broad-shouldered, well set-up and handsome. Those men, Robertson, Stephenson, Caldwell and Holmes, builded wisely, and it is largely to their foresight in transferring their institution to McGill University as the first medical faculty that the splendid position of this university in medical education is due. They anticipated in 1829 the movement whose completion we are but now witnessing on this continent, the transformation of the better proprietary schools into university schools, with all the advantages that implies. Medicine has to-day become too complex, too extensive to be adequately taught by schools started as business ventures; it is only in schools which form an integral part of a progressive university or which possess an adequate endowment that the standards of medical education can be maintained and advanced. McGill is fortunate in that it anticipated so early this essential in medical education, and has been able to maintain without interruption, that relation of the medical school to the university without which the best results cannot be accomplished. Utility is not the only factor in medical education. There is in it also an academic element, without which progress is impossible and which finds its most congenial atmosphere in university surroundings.

But in thus commending the foresight of the founders of the medical department, I would not neglect what is due to those who in later days have had the guidance of affairs. For to them also McGill is deeply indebted for the honourable position she occupies among medical schools. To single out one or two names in this connexion might seem invidious when all members of the faculty have contributed so largely, but the faculty itself has from time to time set its stamp of approval upon certain names, for the interest they have shown in the advancement of medical education not only in their university, but throughout the whole Dominion. I may, therefore, without embarrassment mention the names of Howard and Craik, now no longer with you, and those of Roddick and Shepherd, still active in the good cause and, we trust, long to be spared to give us the benefits of their experience and counsel. Nor would I pass over in silence the name of Dean Birkett, who, with colleagues from this university, from Toronto and from Queen's, is demonstrating to the world the loyalty of Canadian universities and the unity of the Empire in this great crisis that has been forced upon us by Prussian arrogance.

Of the war and the part now being taken so loyally and efficiently by the medical schools of Canada, I need not speak. We are confident that sooner or later the cause for which we and our brave allies are sacrifising our best and bravest, the cause of freedom, honour and idealism, will prevail. But what of the future, what is the outlook for medicine as the result of this war? Prophecy is dangerous work, but one result seems to be so evident that I may venture to comment upon it. Germany long ago perceived the importance of encouraging scientific investigation as the handmaid of the arts, and by the encouragement and utilization of science she had gone far towards achieving for herself a monopoly in certain lines of scientific progress and its application. Students thronged her laboratories from all parts of the world, attracted by the reputation and activity of her teachers, and there was a tendency to look to Germany as a Mecca to which all the faithful must sooner or later make a pilgrimage. In respect to certain articles of manufacture, such as dye-stuffs and some important therapeutic substances, we had become absolutely dependent upon Germany. This war has brought us to a painful realization of our dependency and we are learning that we must become self-reliant and self-sufficient. Germany's scientific dominance is a thing of the past and we Canadians must seriously set ourselves to the task of contributing our quota to progress by the greater encouragement of scientific research and the application of its results. Progress in medicine, especially, must not be allowed to languish and we must take greater part in its maintenance and advancement. In the scientific laboratories you will find your opportunities, for it is through the laboratories that progress has come to medicine in the past, and it is through them that it will come in the future. A beginning has been made, interest has been awakened in medical research, but more than that is needed. It must become a prominent feature of our professional activity if one of the important lessons this terrible war is teaching us is not to be passed, unheeded.

It is customary on occasions such as this that the speaker should be more or less homiletic, giving freely of advice and warning, and perhaps extolling the noble aims and self-sacrifice of the profession you purpose to enter. "Good wine," however, "needs no bush," and the profession of medicine needs no panegyric to confirm you in your choice. As to advice and warning, so much as is individual —and I may hope that in your cases little of this will be required— must necessarily be administered by your teachers, so that there is left for me only what is general, and generalities are too often un-impressive. Furthermore, these generalities have been repeated so frequently, with but slight variation according to the idiosyncrasies of the speakers, that were I to recite them again, even with further variations due to my particular idiosyncrasies, I might, with no little reason, be accused of plagiarism.

I feel myself, accordingly, on the horns of a dilemma. Admonition I would willingly bestow, but I fear comparisons, and so I purpose to seize boldy the horns of the proverbial dilemma, to make no pretensions to originality in what I may say, but to present to you the ideals set up by teachers of medicine in former days for the guidance and emulation of their pupils. I shall cite for your edification, not the teachers of a century ago, not even those of the sixteenth and seventeenth centuries when medicine awoke from the coma in which she had lain throughout the Middle Ages, but I shall go back some three and twenty centuries to the days when medicine began to be a science, and was emancipating itself from the burden of superstition under which it had languished in still earlier times. It may be thought, perhaps, that in these progressive days when the science and art of medicine are advancing by leaps and bounds, we have little to learn from those who practised and taught four hundred years before the Christian era. Their theories of disease were undoubtedly erroneous, their practice in many respects imperfect, but their knowledge of human nature was as thorough as our own and their ideals at least as high. It is especially of ideals that I wish to speak, for no profession demands higher ideals than that of medicine. In no other profession is one brought into such intimate relations with one's clients, no member of society has greater responsibilities than the physician and to those of you who are seeking qualifications for entering the medical profession I wish to try to bring a realization of these responsibilities. Reverence for the teachings of past ages has not quite passed away, and perhaps if I show you how high were the standards of conduct set for the physician many hundred years ago, your reverence for antiquity may gain for them greater consideration than would be granted a more modern exposition of medical ideals.

It is to Greece that, rightly or wrongly, we are accustomed to look for the foundations of all that we prize in literature, art and science, and it was in Greece, in the little island of Cos off the coast of Asia Minor, that the foundations of modern medicine were laid by Hippocrates. Of men who have made an epoch in the history of human achievement we long for personal details. We would, for our example and profit, know of their early training, of their youthful associations, of their virtues both domestic and public, and even of their vices. We would like to know them in their relations to their fellowmen, as units in the complex of humanity. But of Hippocrates little that is authentic has come down to us, so little that one critic has even dared to question his actual existence, notwithstanding the fact that contemporaries, such as Plato and Aristophanes, refer to him under circumstances that sufficiently indicate the great renown to which, as a physician, he had attained even during his lifetime. What we actually know of him has been summed up by a medical historian in few words—"He lived in the time of the Peloponnesian war and he wrote works on medicine in Greek, in the Ionic dialect." Myth and legend have, of course, multiplied about his name, and many acts, sayings, and writings have been attributed to him of which he was undoubtedly guiltless. What we now term the Hippocratic writings consist of more than fifty treatises, but even a superficial examination of them reveals such differences of style and inconsistencies in both theory and practice, that one is forced to the conclusion that one has to do with a collection of treatises by different authors, rather than with the writings of a single man. Indeed the result of modern criticism has been to diminish more and more the number of treatises that can be ascribed to Hippocrates and the final word on this question of authenticity has not yet been spoken. The question is an interesting one for the historian of medicine, but is of but minor importance for the present purpose, since all of the treatises to which I shall refer, if they cannot be directly ascribed to Hippocrates, were at least written by members of the Hippocratic school, and probably were composed before the end of the fourth century before the Christian era. It is therefore the ideals of that time which they present to us, and remote though it be, I think you will find its standards worthy of adoption.

Most familiar to-day of all the Hippocratic writings is "The Oath," a document that should be writ large upon the walls of every medical school, instinct as it is with the spirit of true benevolence. Let me quote it to you:

"I swear by Apollo, the physician, by Asclepias, Hygeia and Panacea and by all the gods and goddesses, taking them to witness that I will fulfil, according to my power and judgement this oath and bond. My instructor in this art I shall esteem as I do my parents. What I have I shall share with him, and if the necessity arise I shall make provision for his needs. His sons I shall regard as brothers and, if they desire to learn this art, I shall instruct them in it without reward or contract. I shall impart the precepts, the oral teaching, and all the rest of the instruction to my sons, to those of my instructor, to pupils bound by contract and by oath in accordance with the custom in medicine, and to no others. According to my ability and judgement I shall direct the regimen of my patients for their advantage, abstaining from all evil and wrong-doing. I shall give no deadly drug to any one, not even to one desiring it, not will I suggest such a desire. Similarly I shall not administer an abortive to any woman. I shall pass my life and practise my art in uprightness and holiness. And I shall never operate for stone, but will leave this to those who practise it. And whatsoever houses I may enter, my object shall be the good of my patients, keeping myself from all wilful wrong and destruction, and especially from all lustful desires for the bodies of both women and youths, whether slaves or free. And in the practice of my profession or even outside it, whatever I see or hear concerning the lives of men that should not be divulged, of such things I shall keep silence, regarding them as secrets. And if I fulfill this oath and do not fail in it, may I reap the reward both in my life and practice by the esteem of all men for all time, but if I be foresworn, may the opposite be my lot."

One must of course make some allowance for the conditions existent in B.C. 400 in applying this oath to the conditions of to-day. Until shortly before the time of Hippocrates the profession of medicine was a closed corporation to which only the sons of those who could trace descent from Æsculapius were eligible, and even in Hippocrates' time, when outsiders began to be accepted, their acceptance was guarded by definite restrictions. These facts explain certain portions of the oath which are hardly applicable to present day conditions, the modern teacher, for example, while grateful for recognition of his services, hardly expecting such extreme devotion as is demanded by the oath. Nor is the attitude with regard to lithotomy entirely in accordance with modern practice, for while one does hear at times suggestions from the specialists, that the general practitioners and surgeons infringe upon their assumed prerogatives, I am not aware that the righteousness of their pretensions has been admitted.

In other particulars the ideals set forth in the Hippocratic oath are well worthy of your emulation. Intelligence, rectitude, honour, discretion; these are the keynotes of the oath, and they are also those to which every medical man must attune his life if he has at heart his own best interests and those of his profession. These virtues are expected of him, and if he fails in them, the greater is his fall.

Littré, in his prefatory remarks upon the oath, has well said "the profession of medicine is one of the most difficult that may fall to the lot of a man; with its grave responsibility, limited power, obscurity in many cases, fugitive opportunities and the impossibility of retracing one's steps. Certainly one may not trifle with the dangerous serpent of Epidaurus. Add to this the personal dangers of the study and practice, the perpetual contact with suffering and death, the scientific training that strengthens and aggrandizes the soul; the feelings of humanity which dominate in the exercise of an art essentially benevolent, and one will not be astonished that even in remote antiquity this serious profession should have inspired a work of so elevated a character as that known as the Hippocratic Oath."

But while the oath might well serve as the text of an edifying homily, it is not the only Hippocratic writing from which words of admonition to the intending practitioner may be cited. In other treatises we find more detailed statements of the requirements one should seek in a medical man, requirements not only mental and moral, but also physical.

Thus in the treatise *de medico* one finds the following: "It is essential for the physician that his complexion be of good colour and that he have that degree of rotundity which may be naturally suitable to him; for it is thought by the vulgar that those not thus physically equipped are incompetent to care properly for others." The Hippocratic writer was of Cæsar's opinion.

> "Let me have men about me that are fat;
> Sleek-headed men and such as sleep o' nights."

You may not all satisfactorily meet this requirement. The exigencies of student life do not encourage the development of embonpoint. But do not be discouraged, the day will come for many of you, I trust, when your anxiety will be aroused lest you may overdo, rather than fail in this requirement. The next items are, however, more under your control. "Further," it is said, "all things about him must be clean, his raiment appropriate and his perfumes agreeable, having an odour beyond all suspicion." Cleanliness is next to godliness, nay, from the surgical standpoint it is of even greater importance. Nowadays with our greater knowledge of the cause and dissemination of disease, lack of cleanliness is criminal for a medical man; "all about him must be clean" and the sooner the habit of scrupulous cleanliness be formed, the better it will be for you and for your future patients. Your raiment should be appropriate, neat but not gaudy, and as to your perfumes, the less said about them the better, but be sure in any event that they are "beyond all suspicion."

And our author continues: "His manner must be both elegant and virtuous, manifesting to all both dignity and benevolence. . . . And he should appear thoughtful in demeanour but not austere, since austerity may appear to imply malevolence. On the other hand he who gives way to mirth and unseemly hilarity is regarded as vulgar. He must be strictly on his guard against this." And in another treatise, that *de habitu decenti*, the author adds the following admonitions: "It is necessary that the physician should possess a certain amount of urbanity, since austerity repels both the sick and the well. . . . He should not converse more than is necessary with those unskilled in the art. For if he does it will be regarded as a challenge of his treatment. And he must above all things avoid officiousness and ostentation."

What a paragon of perfection would be the man who could comply with all these requirements demanded by our medical ancestors twenty-three hundred years ago. And yet who can deny the appositeness of each and every demand. Medical practice is not alone a matter of diagnosis and treatment; it brings the practitioner into such intimate relations to his fellow-man that it demands the exercise of all the social virtues. The author of the *de habitu decenti* has well said that "there is little difference between medicine and philosophy. For all those qualities demanded by the one are required by the other, freedom from avarice, reverence, modesty, moderation, reputation, good judgement, tranquility, affability, cleanliness, intelligence, recognition of what is useful and necessary in life, the avoidance of impurity, freedom from superstition and a divine preëminence," and then, all this he sums up in one pregnant sentence, "The philosophic physician is the equal of the gods." That was the measure of the esteem in which the physicians of old held their profession, and shall we, favoured with all the vaunted progress of our day, permit any diminution of that esteem. But note, if you please, that it is to the "philosophic physician" that the highest encomium is awarded, for that is the type of a physician that a university school aims to produce.

But, splendid though it be and full of interest to us moderns, I may not linger over the wisdom of ancient Greece, since I wish also to present to you some thoughts borrowed from another ancient civilization, that of India. Unfortunately I cannot give even an approximate date for the origin or formulation of the ideas I am about to quote, since in the case of Indian medicine none of the original texts seem to have survived the corroding tooth of time, and we must content ourselves with the writings of later authors by whom in all probability the teachings of their predecessors are more or less fully preserved. It seems, indeed, that none of the Hindoo medical writers, whose works we now possess, antedate the Christian era, but there is internal evidence in their writings that their sources go much farther back. Thus, for instance, it has been pointed out that in the Ayur-veda of Susruta only the worship of Brahma and Indra is mentioned and yet it is known that Buddhism was introduced about B.C. 600 and reached its height at the time of King Açoka, about B.C. 250. This evidence is, however, inconclusive, since it is possible that the writer was a member of the Vaidya caste, the Brahminical medical caste, nor is the evidence to be derived from the traditional origin of the writings any more definite. According to this the original author of the Ayur-veda was Atreya, one of the sacred sages who was taught by the god Indra and imparted the knowledge so obtained to his pupils, one of whom, Agnivesa, made a compilation of his teachings, and this compilation was later revised by Caraka. Similarly the Ayur-veda of Susruta, but little younger than that of Caraka, is said to have been composed by Brahma even before the creation of man and was given to Dhanvantari, the physician of the gods. He, out of pity for mankind, who had in the meantime appeared on the scene, came down from heaven and as King Divodasa took up his abode at Kasi, or as we now term it Benares, where he taught the principles of medicine to disciples who sought his court, Susruta, one of these, compiling from his lectures the work now known by the name of the compiler. The assignment of a supernatural origin to the Ayur-vedas suggests for them a high antiquity, but with all the evidence at present available the question of their original date remains unanswered.

But not for this reason alone are these writings of interest to the medical historian. We have become accustomed to associate the origin of medicine with Greece and especially with Hippocrates, and when therefore one finds in the Ayur-vedas several ideas long supposed to be Hippocratic, one naturally assumes that the Hindoo principles of medicine have been borrowed from the Greeks. Thus one finds both in the Hippocratic and in the Hindoo writings the statement of a humoral pathology, disease being due to the relative excess or diminution of one of two, three or four dominant fluids. In some of the Hippocratic writings but two of these humours, mucus and bile, are mentioned, but in others four are recognized, viz., blood, mucus, yellow bile and black bile, medical theory being thus brought into greater harmony with prevailing philosophical doctrines. Three dominant fluids were recognized by the Hindoos, air, mucus and bile, and while there are thus differences in detail, the similarity in the fundamental idea of the two systems is particularly suggestive. Nor are the resemblances limited to this. The well-known Hippocratic description of the livid, pinched, drawn expression of countenance, frequently observed in articulo mortis and generally known as the facies Hippocratica, is also found in almost verbal similarity in the Ayur-veda of Susruta; the Hippocratic doctrine of critical days in connexion with febrile affections finds its counterpart in Hindoo medicine, and lastly, the similarity between the standards set up by Hippocratic and Hindoo writers is most striking.

It is possible, indeed, at first sight, probable, that these similarities may have resulted from the adoption of Greek ideas by the Hindoo writers and the uncertainty as to the date of the latter tends towards such a belief. It is noteworthy, however, that while we find references to Hindoo medicine even in the Hippocratic writings and know further that Ktesias, a contemporary of Hippocrates, was physician to the Persian court and wrote a description of India, we find in the Hindoo writings no references whatsoever to the Ionians (Yahvanas) as they termed the Greeks. In other words, there is evidence that some knowledge of Indian medicine was in possession of the Hippocratic writers, but there is none that points to the converse.

This is a problem of very great significance in the history of medicine, since upon its solution depends the correct determination of the original sources of scientific medicine. It is a problem, however, which need not be further discussed on this occasion, my excursion into this debatable territory being altogether for the purpose of indicating a possibly high antiquity for the standards set up by the Hindoo physician, Caraka, that I wish to quote to you.

The admonitions of Caraka are somewhat more detailed than those of the Hippocratic writers, and for comparison with the latter I may first quote what is said as to the requisites for a physician. "With his whole soul he must strive for the healing of his patients, and even though his own life be in the balance he must avoid all injury to the sick. In his dress and in all outward adornment he must show simplicity; he must be no wine-bibber and must shun evil companions. His speech must be delicate, clear, pleasant, truthful, pertinent and modulated; he must always observe the conventions required by the time and place; he must be diligent in study, ever seeking to arouse, strengthen and improve his knowledge. . . . When, having the right, he enters the dwelling of a patient, he should be well-dressed and enter with bowed head, thoughtful, with a dignified bearing and yet with all possible respect. Having entered, his words, thoughts and senses must be devoted solely to the treatment of the patient and to the consideration of his condition. He must not babble concerning the affairs of the house, nor shall he communicate to the patient information of a threatened early demise if such information may bring detriment to the patient or to any one."

The similarity to the Hippocratic requirements is unmistakeable, and Caraka as well as the Hippocratic writers, long ago formulated the main points of medical ethics, leaving little that is essential to be added in modern times. So much, however, for the physician and the ethical requirements he was and is expected to meet. Let us leave what is for you, gentlemen, the future and consider what Caraka has to say concerning the present.

Concerning the scholar he says: "He must be sedate and of honourable lineage. He must have straight eyes, mouth, nose and spine, a thin, red and clean tongue, regular teeth and lips, and he must not snuffle. His character must be strong, unselfish and considerate; he must have good judgement and memory and be specially well endowed. He should come from a family of physicians or at least he should have consorted with physicians. He must be a lover of truth, with perfect limbs and senses unimpaired, modest, simple in his attire, reliable, slow to anger, decent, clean, pious, faithful, unaffected and skilled. He must be anxious to learn and must strive without ceasing for the acquisition of both the theory and art of medicine. He must not be avaricious nor slothful, but benevolent to all, following all the instructions of his teacher and relying upon him. He who shows these characteristics may be named a scholar."

Surely, and he might also be named a saint. That is a standard of matriculation that some of us at least might find difficulty in satisfying. But do not let us be down-hearted. The requirements of such a standard seem almost impossible, and yet there were undoubtedly students in Caraka's day, and undoubtedly the gates of mercy must have been opened in those days even as we of to-day, who sit in judgement upon you, open them.

But it is not alone for the physician and student that Caraka set up a standard. Some of us may find something of interest in the qualities he demands in the text-book to be used. "The student should select a text-book which he sees used by well-equipped and intelligent men, one rich in its contents, recommended by experts and suited to the comprehension of all classes of students. It must not weary by repetition, but give the facts, explanations and synopses in their proper order, always adhering to the subject. It must be correct and pleasing in style, rich in its terminology and methodical, the ideas being clearly expressed, and correlated facts brought together without confusion of the principal point. It should be easy to understand, and well-supplied with definitions and examples. For such a text-book scatters the darkness like the clear sun and illuminates everything."

And finally, hear what he has to say regarding the teacher. "The scholar," he says, "should look for a teacher whose instruction is public, whose practical skill is proven, who is clever, versatile, upright and blameless, whose hand knows how to rule, who has the necessary ability and all his senses, is familiar with normal conditions and skilled in treatment, full of true knowledge, unaffected, neither unfriendly nor passionate, patient; full of affection to his scholars and possessed of the gift of teaching. A man of such characteristics is a master. As the timely clouds endow the fertile field with fruit, so he quickly endows the good scholar with the characteristics of the physician."

This needs no comment. You will find among your teachers many who will measure up to such a standard. Let them be your guides and examples. But remember that all the virtue that may adorn your teachers cannot suffice to make of you a competent physician unless you too do your share. You are here not so much to be taught as to learn, the passive must give place to the active, and your part must not be that of fledglings who flutter about with mouths agape hoping that some succulent morsels may be thrust therein, but rather that of those who have tried their wings and seek and choose their own pabulum. That, I take it, is the difference, and it is an important one, between school and university training. To the one one goes to be taught, and to the other to learn. You come here to learn the principles and practices, the science and art of medicine, and you will find much to learn and abundant opportunities for learning. But you will not find medicine an easy task-master and you will be able to utilize your opportunities adequately only by the exercise of the utmost diligence. That is the essential. "See'st thou a man diligent in his business; he shall not stand in the company of mean men." You have great opportunities before you and accordingly your responsibilities are great, responsibilities to your teachers, to the university, to the public and to yourselves.

> "To your own selves be true
> And it must follow, as the night the day,
> Thou can'st not then be false to any man."

But I have fallen into the pit which I had determined to avoid. And yet, after all I am but emphasizing a requirement demanded by those of times remote. Let me add it to the keynotes of the Hippocratic oath, and in closing repeat them, that they may linger in your ears as requirements that will be demanded of you as members of the medical profession and graduates of McGill:

Intelligence, rectitude, honour, discretion and diligence.

THE Dutch steamship *Batavier III*, from Amsterdam, has landed at Havre a flying hospital, organized by private subscription and placed under the command of Dr. Bierens, of Haan, who has already directed organizations of this kind in the South African War of 1899-1901 and the Balkan Wars. The staff comprises, besides Dr. Bierens, 4 physicians, 26 female nurses and 5 male nurses. This Dutch hospital unit, composed of 200 beds and capable of being moved in forty-eight hours, was sent to Paris, where it was received at the Saint Lazare station by representatives of the assistant secretary of the medical service and by Medical Inspector-General Dziewomski, director of the medical service of the military government of Paris.—*Journal of the American Medical Association.*

REMARKS ON THE CHARACTER AND TREATMENT OF WOUNDS IN WAR

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SINCE the introduction of the modern rifle, machine-gun and artillery, the majority of wounds in war are those caused by projectiles of one form or another. The great improvement in these weapons increasing their accuracy and range, accounts for the infrequent occurrence of bayonet, sword and other side arm wounds. Bayonet wounds are occasionally seen in the form of punctured wounds in the muscular part of the body, or lacerated wounds of the left hand, produced by the soldier grasping his opponent's bayonet in a hand-to-hand conflict. The majority of bayonet wounds are abdominal, causing death on the field. Therefore the wounds may be regarded almost all as gun-shot wounds. These wounds present an appearance varying from the small punctured wound of the rifle bullet to severe multiple lacerated wounds produced by shrapnel, which are not unlike those seen in civil practice caused by machine and railroad accidents. The sharp pointed rifle bullet will usually make a small sinus through the soft tissues, if the range is over three hundred yards. Plate No. 1 shows the small wound of entrance, and Plate No. 2 indicates an equally small exit wound, which is covered by adhesive. In this case the bullet came in contact with bone, went through the face and neck, causing very little destruction of tissue, and leaving an aseptic track, as no suppuration occurred in the wound.

Bullet wounds at close range produce an explosive effect, that is, the destruction of tissue is greater and the wound of exit is much larger than the wound of entrance.

Plate No. 3 shows plainly the small wound of entering, and the extensive destruction of the tissues of the neck at the point of exit. This destruction may have been brought about by the bullet turning on its short axis, as in the case of the German bullet the

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centre of gravity is very close to the base of the bullet, so that it readily turns when it encounters irregular resistance.

There is no evidence that dum-dum bullets have been used, but the Germans have the habit of inverting the bullet so that the base enters first, causing the bullet to expand.*

The destructive effect of these inverted bullets is shown in Plate No. 4, where the tissues, including the tendons, were severely torn. The effect of a rifle bullet upon bone varies from a punctured wound to severe destruction involving the whole shaft of long bones. The effect of shrapnel bullets does not differ materially from that of a rifle bullet. Shrapnel casing, hand-grenades and bombs all produce irregular lacerated wounds on the surface of the body. On account of the irregular size and shape of the missiles, they produce severe destruction of the tissues. If a vital part of the body is severely injured by shrapnel the patient usually succumbs on the battlefield.

PLATE NO. 1

PLATE NO. 2

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*Clips of German cartridges have been frequently found with inverted bullets.

Severe head injuries frequently associated with fracture of the skull are produced. Chest wounds associated with empyema are frequently seen. Injury to the different viscera are met with, as in the case of a soldier admitted after the battle of Neuve Chapelle, wounded by shrapnel in the right hip. A long, irregular piece of shrapnel had passed through the great sciatic notch, ruptured the bladder, but did not penetrate the abdominal cavity. A supra-pubic cystotomy was performed and the shrapnel removed through the tear in the bladder.

Plate No. 3

The sinus produced by shrapnel in the soft tissues requires special consideration, in order to appreciate the method of treatment followed. The sinus varies in size in proportion to the size, shape and velocity of the fragment producing it. The sinus tract is very irregular, as muscle fibres cut at different levels, retract unevenly. If the sinus is parallel to the muscular fibres the sheath of the muscle may be torn, causing rupture of the muscle into and obliteration of the sinus tract at different points in its course. This interferes with drainage, has a tendency to produce a closed cavity causing the rapid incubation of bacteria. If bone is encountered by the portion of shrapnel you will invariably get cavities leading in various directions from the main sinus. In many cases portions of clothing, varying in size, are carried in with the shrapnel the full length of the sinus. These particles of clothing are covered with the highly-fertilized germ-laden soil found in France, which accounts for every shrapnel wound being septic.

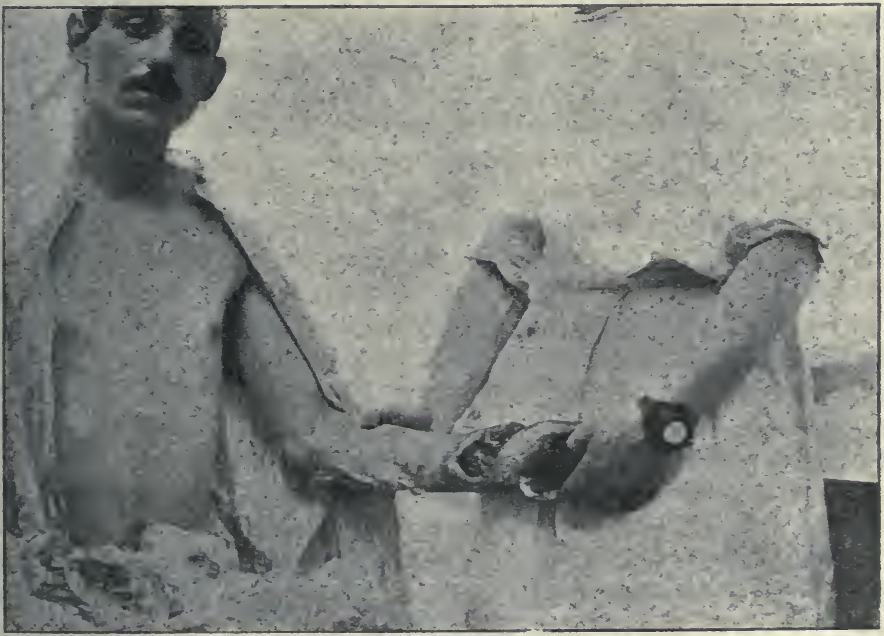

Plate No. 4

With regard to wound infections, we have found streptococcus most frequently present. Tetanus bacillus has made its appearance in a number of cases, while the bacillus ærogenes capsulatus of Welch frequently produces the much-dreaded gas gangrene.

Before discussing briefly the special treatment of these cases of infection caused by the germs mentioned in the previous paragraph, I wish to state a few points of importance with regard to the surgical manipulation which applies to all wounds. Understanding as we do that germs are distributed along the whole course of the irregular sinus produced by the missile, and that the focus of most virulent infection is usually situated at the bottom of the sinus where the shrapnel and perhaps a piece of clothing are located, the obvious treatment is to promote free drainage. This is done by enlarging the wound of entrance, if necessary, and by making a counter opening over the seat of the missile, removing it and cleansing the sinus, when a drainage tube is placed in position. This tube should be of such a size as will lie loosely in the wound, so as to permit free irrigation between the tube and the tissues forming the walls of the sinus. The use of the probe in thigh cases is to be condemned, as a small metallic instrument readily finds its way between the muscles, carrying infection and trouble along its course. We have found, with the assistance of the *x*-ray, all that is necessary is to enlarge the wound of entry, so as to permit the entrance of the gloved finger, which is the most effectual way of exploring the sinus and locating the missile, which determines the site of the necessary counter-opening.

Slight superficial wounds are drained with rubber tissue. Gauze packing on no account should be employed.

We are not dealing with the clear-cut wounds capable of chemical disinfection, usually seen in civil practice. The time elapsing from time of injury to admission in hospital and the irregular and inaccessible nature of the surface to be disinfected, renders antiseptics useless or at least limits their use to the disinfection of the skin and slight superficial injuries. In the field ambulances and clearing stations 2 per cent. tincture of iodine is chiefly used.

On a good many cases the much-lauded Cheatles paste was used. This paste is composed of powdered cyanide of zinc and mercury, made into a paste by mixing it with 1 in 20 carbolic acid. We have observed a number of cases upon which it was used and we are of the opinion that it is harmless so far as superficial scalp wounds are concerned. Its use, however, was very unfavourable in the deeper wounds, preventing free drainage by blocking the sinus, as in almost every case foul-smelling pus was prevented from escaping. The introduction of an antiseptic into a cavity sufficiently strong to kill germs causes destruction of the leucocytes, and prevents the phagocytic action of those arriving at the seat of infection after the antiseptic has lost its effect on the remaining bacteria. We have therefore found that the use of a hyper-tonic salt solution composed of ½ per cent. sodium citrate and 5 per cent.

solution of common salt known as Wright's solution, used by the continuous drip method, cleans the cavity, carrying away bacteria, and promotes the continuous flow of lymph to the part containing fresh vigorous leucocytes, capable of destroying any bacteria that may be left behind by the salt solution or faulty drainage. After the infection has cleaned up an aseptic dressing is all that is necessary.

With regard to gas gangrene, the superficial variety is treated by freely incising the part, and the liberal use of hydrogen peroxide and exposure to air. Lactic acid has proved absolutely useless in our hands, but not disappointing, as the bacillus of Welch produces lactic acid and is able to live in that medium. The deep variety of gas gangrene is controlled only by amputation of the affected limb. A circular incision is used, the cut surface is left exposed, no sutures are used, and the exposed surface is treated with hydrogen peroxide and salt solution application.

To appreciate fully the saline treatment which is based upon reason and capable of proof, as is shown by the excellent results obtained, we must have a clear conception of the series of conditions into which tissues enter as a reaction to irritation, known as inflammation, and defined by Professor Adami as the series of changes in a part which constitute the local attempt at repair of injury to a part.

The readers of this article who have had the good fortune of receiving the excellent clinical teaching of the late Professor Cheyne, of Edinburgh, will remember his impressive and useful way of teaching, by the presentation of important points in triangular construction. We would recall two of the more important: the first, warmth, quietness, and asepsis, comprise the essentials in an operating room. The other has regard to the value of antiseptics, but at the present time it has a wider application. His exhortation was: "Put not your faith in kings, princes, or boracic acid."

DELIVERY BY HYSTEROTOMY—FIVE INSTANCES

By H. E. Kendall, M.D.

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AMONG the events marking the progress of the surgical art, the growth of the operation of Cæsarean section is a notable one. To the student of the eighties, its very name was awful and holy, and the procedure was to be thought of by the very bold only, after every other hope had fled. Now all one needs to guard against is infection, and the operation can be lightly selected, if suitable for the case in hand. In short, it is often good practice to cut the uterus and sew it up again instead of waiting unduly or dilating and tearing it when one desires to empty it quickly of its contents.

The first case to be reported is one of the classical Cæsarean section or abdominal hysterotomy. The patient, a young woman, had her first two children through difficult forceps operations. Both were born dead, and her return to health after both confinements was slow. She had a moderately contracted or male pelvis. For her next ordeal, she was offered the Cæsarean section and gladly consented. The three infants following were therefore born by that method, healthy and unblemished, while she herself had the advantage of three rapid and uneventful recoveries.

In each instance the operation was left till the onset of labour. Preparation was begun as soon as she reported pains, the operation being done about two hours afterwards.

By this timing one had the advantage of enough dilation of the cervical canal to obtain good drainage. The uterus was delivered before being incised. In one instance the placental site was cut into, although it was sought to avoid it. Hæmostasis was much more difficult in this case. Some of the sinuses had to be ligated, and a much larger number of sutures were required in closing the incision. The suture material used for the first operation was

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chromic gut. The second delivery was three years after the first and the line of closure showed no scar even. At this second operation, linen was used for the deep sutures. Eighteen months afterwards the third opening was made, and the linen stitches were still quite prominent. For this last chromic gut was again used. The uterus was opened in a different place at each delivery, but always longitudinally. One simply tried to avoid large vessels and the probable placental site.

In general a few points in technique may be brought to memory.

The uterus is generally delivered before being opened. It is, however, by some inclosed "in situ." This latter makes a shorter abdominal scar, but one can see no other advantage.

The control of hemorrhage is very easy in the hands of an assistant if the uterus has been delivered. There is no need for a ligature thrown round the lower segment.

The incision is usually made longitudinally, but a transverse cut across the fundus has been used and recommended.

Just before incising the uterus it is well to give a hypodermic of pituitary and ergot.

In repairing the uterine wound the sutures may be of chromic gut or linen and should go through all coats except the mucous.

They should be interrupted accurately approximated and carefully tied. Over all a layer of fine silk or other suture material should seal up the peritoneal coat.

If the cervix is not already dilated sufficiently to allow of full drainage, this should be obtained by digital force before the incision is closed.

In the books the mortality of the procedure as a whole is put at 10 per cent., but this is misleading. The elective Cæsarean section, decided beforehand and prepared for, is one thing, but done after frequent examinations or attempted delivery and when the patient is possibly infected and certainly exhausted is quite another. The two should not be mixed in statistics or in our minds.

As to the indication in county practice, for we do not very often come across such cases, given a woman who has been treated with reasonable skill and lost her first two children from a moderate disparity between the size of the fœtal head and the maternal passage, she is entitled to a choice of two methods for her next.

1. Labour brought on at eight months
2. The elective Cæsarean section.

In the first case she is not sure of a live child, and being born alive it has to meet the dangers of the premature infant. In the latter she has no reason to fear for the child or herself. The Cæsarean section is undoubtedly the most promising.

The second case is as different from the first as can be. It was one of placenta previa at five months. The patient was a multipara and her previous confinements had been uneventful. She had now been bleeding for two months. The last month was spent in bed. As she was exsanguinated, the call for relief was urgent.

In planning for her three considerations pressed:

1. The uterus must be emptied.
2. There must be no blood lost in doing it.
3. Where no previous pains have occurred to soften the cervix the difficulties of obtaining forced delivery at five months are very great. It takes a long time; much force; and usually considerable trauma is inflicted before one gets enough dilation to get a leg down even where there is no placenta blocking the way.

Hysterotomy was the obvious way to meet this emergency and the vaginal route seemed the best. Accordingly an incision was made in the anterior cervico-vaginal junction, and the uterus separated from the bladder as for a vaginal hysterectomy. The uterus was then split up until the placental site was passed and the membranes presented. These were ruptured. A foot was brought down with tissue forceps, and the child easily extracted. Afterwards the placenta was peeled out bi-manually. There was no loss of blood, and the whole procedure including the repair of the uterine wall by chromic gut sutures, took a short half-hour. Recovery was quite smooth and reasonably rapid.

This case leads one to ask whether at full term and placenta previa, the same procedure might not sometimes be called for. Given excessive bleeding, with a rigid cervix, and no labour pains, there is good authority for the method as it promises a better control of hæmorrhage than the more conservative methods. Of course, if labour had come on and there was some dilation so that a leg could be brought down for a tampon, one would naturally adopt that method, or the use of a Champetier de Ribes bag to control bleeding and favour dilation. The dividing line between these methods would be a fine one, to be decided only in the face of the several difficulties of the case in hand.

The third case differs equally from the other two. Here the patient had come to full term and was suffering from eclampsia. When seen she had had convulsions every few minutes for five hours. Labour had not begun. The cervix was rigid and long. A drachm or two of urine removed per catheter was found highly albuminous. Rapid delivery was decided upon by vaginal hysterotomy. The bladder was separated from the uterus as in the previous case. The uterus was then split up far enough to permit of the comfortable application of forceps to the fœtal head. Delivery of a living child was rapid and easy and the whole proceeding not taking more than twenty minutes. Afterward 20 ounces of blood were taken from a vein and replaced by 20 ounces of saline. She had no more convulsions and consciousness was returning in twelve hours.

On the question of the general treatment of eclampsia there is good reason to believe that the "*accouchement forcé*" in any form is an admission of failure in earlier treatment.

If the case is seen near the beginning of symptoms and thorough eliminative measures together with suitable starving are persisted in, one should generally be able to tide the patient through to a spontaneous delivery without reaching the stage of desperation which calls so loudly for a forcible emptying of the uterus. Nevertheless, if this latter must be done, rapidity, a short anæsthesia, and a minimum trauma indicate that the vaginal hysterotomy is eminently suitable.

As a result of the difficulty of obtaining sufficient number of surgeons for active service, the age limit in Great Britain has been extended for home service from fifty to fifty-five years, and for foreign service from forty to forty-five years.

It is announced that the employees of the Massey-Harris Company, Toronto, are prepared to establish and maintain in England a convalescent home for wounded Canadian soldiers. The cost of equipment will amount to about $25,000, and it is estimated that $50,000 a year will be required for maintenance.

DYSPNŒA IN CARDIO-RENAL DISEASE

By Thos. F. Cotton

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DURING the summer of 1913 observations on a series of cardio-renal cases showing a dyspnœa peculiar to these patients were made in London by Thomas Lewis, J. H. Ryffel, C. L. Wolf, T. Cotton and Joseph Barcroft. A preliminary communication of the work done was made before the chemico-pathological section of the International Medical Congress by Lewis and Ryffel, and a full account of the results obtained appears in the November issue of *Heart*. In view of the fact that *Heart*, a journal devoted to the study of the circulation, has only a limited number of subscribers in Canada, and because the results obtained are of such importance that the general practitioner as well as the internist should be acquainted with them, I have thought it advisable to give to the readers of the Canadian Medical Association Journal a short review of this article; and in addition to report some observations which I have recently made in the wards of the Montreal General Hospital.

It has long been observed that breathlessness may be accompanied by varying degrees of cyanosis and that on the other hand subjects with congenital heart lesions may be deeply cyanosed, and yet show little or no dyspnœa. This comparison of the degree of breathlessness with the degree of cyanosis suggested to these workers that some other cause than that of insufficient æration of the lungs must be found to explain the dyspnœa present.

Two classes of cases are of particular interest in this respect, in that the breathlessness present is quite out of proportion to the cyanosis; to the one class with the renal factor predominating is applied the term uræmic dyspnœa; to the other with symptoms and signs referable to the heart is given the name cardiac asthma. Between these two groups of patients occur those which must be spoken of as cardio-renal cases, since both organs show functional impairment. The breathlessness of uræmic dyspnœa and of cardiac asthma, and that present in a certain proportion of the cardio-renal cases have features in common. It was with a view of determining whether some common factor might be found which could explain this dyspnœa that these investigations were undertaken.

These cases may be recognized clinically by certain common features which they present. The breathlessness, usually gradual in its onset, though it may be sudden, occurs in elderly individuals. This dyspnœa is usually accompanied by a slight degree of cyanosis quite insufficient to explain the respiratory distress; it is of varying degree, at one time intense; at another slight; it is increased by exercise, and more often nocturnal, and generally, though not always of the Cheyne-Stokes type. There is a moderate degree of anæmia, considerable emaciation, and torpor, even coma, may be present. The heart is enlarged, the pulse rate is increased, 80-100; there may be signs of some valvular lesion, varying derangements of the heart's mechanism are to be noted, and some degree of nervous stasis is usually to be made out. The heart is dilated, hypertrophied and fatty, coronary disease is always present, and angina pectoris is not uncommon. The arteries are thickened, and there is hypertension.

Polyuria and thirst are common accompaniments and the specific gravity of the urine is low. Albumen and granular casts are present in a large majority of the cases. Retention of urea is present in the moribund cases, chloride retention is absent. The kidneys may be contracted, but oftener are large and show a fine granular surface with arterial degeneration and fibrosis. Retinitis is usually absent, headache is common, vomiting and convulsions and hemiplegia have been noted. A subnormal temperature is fairly constant. The termination is fatal in most of these cases, particularly if symptoms of cardiac failure are prominent.

With a view of explaining the dyspnœa in these cases by a chemical stimulus in the blood acting on the respiratory centre, blood gas analyses were made in each instance. It is now firmly established that acids circulating in the blood act as a stimulus to the respiratory centre. We are thus able to explain the dyspnœa occurring after exertion by an increased production of CO_2 and lactic acid in the body, both acids circulating in the blood and so rendering it less alkaline. The estimation of CO_2 was made in those cases with dyspnœa and little cyanosis, and also for purposes of comparison in cases of simple cardiac dyspnœa, and in those showing no dyspnœa.

The method adopted for the estimation of the acidity of the blood is a most exact one, and depends on the property which hæmoglobin has of absorbing oxygen. The greater the degree of acidity, or more correctly, the less the alkalinity of the blood, it always being alkaline, the less will be the absorption of oxygen by the hæmoglobin, when exposed to a pressure of that gas. If CO_2 be added to blood in increasing amounts, the blood will become less alkaline, and if exposed to a constant oxygen pressure will absorb a corresponding less quantity of oxygen. That condition in which the blood takes up less oxygen than in the normal state is spoken of as meionexy, and indicates a shifting of the reaction in an acid direction; that condition in which it takes up more oxygen than normally is called pleionexy. In order that the degree of meionexy might be expressed in units, a formula based on the conception that the interaction between hæmoglobin and oxygen is a reversible chemical change, was made use of. The molecules of oxy-hæmoglobin form at a certain velocity from oxygen and reduced hæmoglobin, and again break up at another velocity into oxygen and hæmoglobin; the ratio of these velocities the one to the other is signified by the letter K. The greater the meionexy; i.e., the greater the acidity of the blood, the lower the value of K, and the converse.

Of the cases examined, an increase of CO_2 in the blood was found only in those showing simple cardiac dyspnœa. In those cases of so-called cardiac asthma and uræmic dyspnœa there was a diminution of CO_2 in the blood. There was, however, a change in the reaction of the blood, since the value of K was low in all these cases. Some other chemical substance was present rendering the blood more acid, and at the same time replacing in part the CO_2. Hence some other cause than an insufficient æration of the blood with a consequent increase of CO_2 had to be found to explain the increased stimulation of the respiratory centre.

The property which hæmoglobin has of taking up oxygen according to the degree of acidity present was again used in estimating quantitatively the non-volatile acids in the blood. The blood from which the CO_2 has been removed, on exposure to a known pressure of oxygen, absorbs oxygen according to the degree of its acidity. If lactic acid be added to blood free from CO_2 (this is obtained by whipping the blood for a few minutes) the percentage of oxygen absorbed will diminish with the increase in the acidity. We are thus enabled to express the degree of acidosis in terms of lactic acid. In a normal individual the percentage saturation of oxygen varies between 70 and 80 per cent. Those cases with dyspnœa and little cyanosis (cardiac and renal asthma) gave percentages varying between 14 per cent. and 69 per cent., while the cases of simple cardiac dyspnœa gave figures 71-86 per cent. One may conclude from these low values the presence of a definite acidosis; the nature of the acids producing this acidosis was not determined. There was no excess of lactic acid in the blood, nor did the urine show any increased production of organic acids. It is probable that the acidosis is due to a retention of acids rather than an increased production—a condition similar to that seen among individuals living in high altitudes.

Of the nineteen cases on whom clinical observations and blood and urinary analyses were made, eight showed acidosis and Cheyne-Stokes respiration, three acidosis with breathlessness but not of the Cheyne-Stokes type, four simple cardiac dyspnœa and four were simple controls.

From the above observations and analyses the following conclusions may be drawn: dyspnœa with slight cyanosis seen in elderly patients subjects of cardiac disease is due not to an excess of CO_2 brought about by insufficient æration of the blood, but to an acid intoxication. This dyspnœa is often of the Cheyne-Stokes type and is accompanied by various signs of cardiac failure; hypertension is common, renal impairment is constant, and wasting and a subnormal temperature are to be noted. There is probably no real difference between cardiac and renal asthma; and the dyspnœa is probably due to renal insufficiency. The dyspnœa in the majority of cases may be attributed to acid intoxication. The pure cardiac dyspnœa is accompanied by an excess of CO_2 which by rendering the blood more acid acts as a stimulus to the respiratory centre.

During the past month there have been under observation in the medical wards of the Montreal General Hospital five cases offering a clinical picture similar to that described above. I have to thank Professors Finley and Lafleur and Doctor W. A. Molson, in whose wards they were, for the privilege of reporting them.

B. S., a Russian woman, aged forty-eight, was admitted complaining of breathlessness and precordial pain. Personal history: Patient came to Canada nine years ago. While in Russia she had a tumor removed from her face in the region of the left parotid gland. On two occasions, six and two years ago, respectively, she was treated in another hospital for breathlessness similar to that now complained of. This breathlessness was present during the day, but more marked at night. She would be suddenly awakened at night with a feeling of suffocation, and sitting up in bed did not seem to relieve her. This dyspnœa was not accompanied by pain, nor was there any œdema. There is no history of rheumatism or any other infection.

Family History: Five children are living and well; three are dead. Her husband is living and well.

Present Illness: For the past two years her breathlessness has gradually increased. The attacks of suffocation at night have been more frequent, and the same symptom is present during the day. This dyspnœa is not relieved by sitting up, nor is it increased lying down. She has lost considerable weight, and her appetite has been poor.

Present condition: A dark haired middle aged woman with a pale sallow complexion. There is no cyanosis; perhaps a slight blueish tinge to the lips. She lies in a semi-recumbent position and is dyspnœic. The respiratory curve shows a periodic waxing and waning of the excursions; there is no definite period of apnœa. She shows a considerable degree of emaciation, and there is no œdema. The chest is not emphysematous, the lungs are hyper-resonant, expiration is rather harsh and slightly prolonged, and a few moist râles are to he beard in the right axilla. The heart is enlarged, the relative cardiac dullness being the third rib above, 3 cm. to the right and 15 cm. to the left of the mid-sternal line. The heart sounds are irregular, and a systolic murmur is to be heard at the apex. The irregularity is due to fibrillation of the auricles with ventricular extrasystoles (digitalis coupling). The low ventricular rate may be explained by the digitalis. The arteries are thickened and the blood pressure 160. The urine shows a trace of albumen with a few granular casts. The temperature is subnormal varying between 95° and 98°. At different times during her stay in the hospital there has been a complete absence of respiratory distress; and occasionally she has been troubled with a hacking cough, particularly at night. She remained in the hospital for two weeks, on a salt-free diet and restricted fluids and was discharged improved.

Case 2. A. G., aged forty-two, was admitted October 28th, 1913, complaining of shortness of breath and a bad cough.

Personal history: Born in Roumania, he came to Canada fourteen years ago. In 1903 he was in bed six weeks with rheumatism; in 1910 he was treated in one of the Montreal hospitals for the same condition. He has had typhoid fever, denies any venereal infection, and does not smoke or drink. He is a shop-keeper and has little work to do.

Present illness: Early in June, 1913, he complained of cough and breathlessness. He became dyspnœic on slight exertion, at night he would be awakened with a feeling of suffocation. He sleeps propped up in bed, has not complained of pain, and has had no œdema. He has had a poor appetite and has lost a great deal of weight.

Present condition: A pale poorly nourished man, he sits up in bed with signs of great respiratory distress. His lips are a little cyanosed and he is very restless, constantly moving about the bed. Cheyne-Stokes breathing is easily recognized and is confirmed by the respiratory curve. The chest is emphysematous, the breath sounds are vesicular with prolonged expiration, and a few crepitant râles are to be heard in the left axilla. The pulse is regular, the rate increased (86), the volume is fair, the tension is increased (145), and the arteries are palpable. The apical impulse is thrusting, in the sixth space, 14 cm. from the mid line. The heart is enlarged to the right and left, the limits of relative cardiac dullness being the third rib above, 6 cm. to the right of the mid-sternal line and 16 cm. to the left. A harsh blowing systolic murmur of maximum intensity at the apex is heard over the whole of the præcordium, and is transmitted to the axilla and back. The liver is slightly enlarged, and there is some ascites. The urine shows albumen and granular casts; there is no retention of urea (·43 gms. per liter) and the fundi are normal.

A week after admission some œdema of the legs was noted; this gradually increased, and in addition some increase in the size of the liver. Dyspnœa of the Cheyne-Stokes type was present as before, and there was considerable pain over the præcordium. The patient left the hospital in this condition.

Case 3. E. L. G., aged forty-seven, was admitted November 1st, complaining of shortness of breath, cough, asthma, bloating of the legs and hands.

Personal history: Patient is an American and has been a liveryman the greater part of his life. He had diphtheria and measles in childhood, gonorrhœa twenty-seven years ago, and has been an alcoholic for many years.

Present illness: For the past ten years he has complained of asthma. These so-called attacks of asthma would often occur at night, occasionally in the day. He would be suddenly awakened from sleep gasping for breath. This breathlessness has gradually increased, so much so that since March 13th, 1913, he has been unable to work, and since September 15th he has remained in the house. During the past few months he has complained of palpitation, and since October 1st he has had œdema of the legs.

Present condition: The patient is a large framed man looking the age stated. He has lost considerable weight, has a sallow tint, and lies in a semi-recumbent position. He is dyspnœic, but can lie flat for ten minutes without increased discomfort. The respiratory curve shows the Cheyne-Stokes type of breathing, with short apnœic periods. This type of breathing could easily pass unrecognized unless carefully looked for. The chest is rather barrel-shaped, the percussion note is hyperresonant, and sonorous coarse bubbling râles are heard over both lungs. The patient coughs often during the examination, and the sputum cup contains a little viscid mucoid sputum. The heart is enlarged to the left past the nipple line (16 c.m. from the mid line). There is a thrusting apical impulse, which is felt outside the nipple line and in the fifth and sixth interspaces. A short systolic murmur is heard at the apex, there is gallop rhythm, and the aortic second sound has a booming quality. The pulse rate is increased (118), the tracing shows pulsus alternans with occasional premature ventricular contractions. The arterial wall is thickened, and there is hypertension (155). The liver is enlarged and tender, there is some dullness in the flanks, and considerable œdema of the legs. The urine is of a dark brownish-red color, the sp. gr. is 1025, and a heavy ring of albumen and granular casts are present. The total quantity passed in the twenty-four hours is 1,100 c.c., there is no retention of urea, a diminution of chlorides in the urine. There is no retinitis and the temperature is subnormal.

The patient was put on a salt-free diet and restricted fluids. Under this regime the dyspnœa became less marked, the respiratory curve normal, the œdema and ascites disappeared, and the patient left the hospital improved.

Case 4. A. D., aged forty-two, was admitted September 15th, 1913, complaining of shortness of breath, precordial pain, hæmoptysis and headache.

Personal history: At seven she had chorea and measles. Has had three criminal abortions, denies any venereal disease, and gives no history of rheumatism.

Present illness: In 1912 she was in bed on two occasions because of shortness of breath and attacks of suffocation. For the past year on the slightest exertion she has been dyspnœic. Often at night she is awakened with a feeling of suffocation. These attacks have become more frequent. Precordial pain usually is present after exertion, though it may occur at night, when it is associated with breathlessness. She has had no œdema, and no hæmoptysis until a few days before admission.

Present condition: She is sitting up in bed, quite breathless, pale, slightly cyanosed, and emaciated. This dyspnœa is of the Cheyne-Stokes type. the respiratory curve showing definite apnœic periods of a duration of 14 to 16 seconds. The chest is not emphysematous, and the breath sounds are normal. The heart is enlarged to the left (15— cm.). There is a loud systolic murmur at the apex, and the pulmonic second sound is accentuated. The pulse tracing shows an occasional ventricular extrasystole, and pulsus alternans. The pulse rate is 108, the arterial walls are thickened and the blood pressure is 150. The urine is diminished in quantity (500 c.c.) with a spg. of 1026, and has albumen and granular casts. There is some retention of urea, ·66 gms. per liter, and there is no retinitis. The red blood cells are diminished in number—4,160,000; there is an increase in white cells—12,800, and the hæmoglobin is 60 per cent. The Cheyne-Stokes breathing continued throughout her illness, the temperature remained subnormal, thrombosis of the right subclavian vein, œdema of the lower extremities, and other signs of stasis resulting from cardiac failure developed before death (November 15th). The post mortem findings were: myocarditis, mitral endocarditis (acute); chronic nephritis, right pleuritis with effusion, ascites and thrombosis of the right subclavian vein.

Case 5. H. McM., aged sixty-two, was admitted October 27th, 1913, complaining of a hacking cough, breathlessness, palpitation of the heart, and weakness.

Personal history: He is a Canadian by birth, and for the greater part of his life has worked in Montreal as a malter. He gives a history of measles and scarlet fever in childhood, and typhoid fever at twenty-two. As a child he was troubled with palpitation, this being particularly noticeable in the morning. At this time he was not allowed to run or do any heavy work. At the age of twenty-one he had a great deal of heavy lifting to do, and often was obliged to rest because of breathlessness. There is no history of rheumatism or any venereal disease. He drinks in moderation, and is not an excessive smoker.

Present illness: In the past few years he has had more or less dyspnœa on exertion; this has gradually increased. Early in Spetember he seemed to be more breathless than usual, and was often dyspnœic at night, waking up suddenly, gasping for breath. This respiratory distress continued to increase, and was accompained by precordial pain. He has had little or no cough, and never has there been any œdema.

Present condition: The patient lies in a semi-recumbent position. He is pale with a bluish tinge to the lips, and is considerably emaciated. He is dyspnœic, at times gasping for breath. Definite periods of hyperpnœa and apnœa may be distinguished. The respiratory curve shows regularly recurring periods of hyperpnœa and apnœa; the former with a duration of 27 seconds, the latter somewhat longer, 30 to 36 seconds; The chest is emphysematous, there is a hyperresonant note throughout, and crepitations are heard at both bases. The heart is enlarged to the right and left; relative cardiac dullness is at the second rib above, 7 cm. to the right and 17 cm. to the left of the mid-sternal line. The heart sounds are distant, the rhythm is grossly irregular, and there are no murmurs to be heard. The polygraphic tracing shows a grossly irregular heart action with a ventricular form of venous pulse—auricular fibrillation. The pulse rate is 95-100, the blood pressure 165 and the arteries are thickened. The urine is diminished in quantity (825 c.c. per 24 hours) has a specific gravity of 1020 and has a small amount of albumen and granular casts. 0·6 mg. of phenol-sulphophthalein were injected into the right lumbar muscles, and at the end of two hours 48 per cent. was excreted (normal 60-70 per cent.). There is considerable retention of urea, 1·53 gms. per liter, but no retinitis. The liver is palpable ·3 fingers breadth below the costal margin; there is some abdominal distension but no ascites. The temperature is subnormal, the Wassermann reaction negative.

Since admission the patient has gradually grown worse. The Cheyne-Stokes breathing persists, the heart's action weaker, the urea in the blood has increased to 1·77 gms., and he lies in bed in a comatose condition, at times quite excited and irrational.

THE appeal made by Sister Beatrice Bartlett, of the French Military Service de Santé, has resulted in the formation of the French Military Hospitals' Society. Money and supplies will be collected by the society to assist the work of the French hospitals, and will be forwarded to Miss Bartlett.

ACUTE ŒDEMA OF THE LUNGS

BY ALBERT G. NICHOLLS, M.A., M.D., D.Sc.

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IT is a somewhat singular fact that while acute œdema of the lungs is one of the commonest pathological conditions found *post mortem*, as a clinical manifestation it is by no means so frequent. The affection is found most often in connexion with Bright's disease, pneumonia, and obstructive cardiac lesions, yet after a somewhat extensive experience with these diseases, I can recall but some ten or a dozen cases in which acute pulmonary œdema became obtrusive as a physical sign. The great disproportion between the numbers of cases occurring *post mortem* and *ante mortem* is explained by the fact that in the former acute œdema is a manifestation of the death agony, a result, therefore, rather than a cause. Yet, while uncommon, the condition is of such grave import, and so often directly imperils life, that attention may very usefully be directed to it.

As a pathological entity, pulmonary œdema may be defined as a condition of the lung in which the vessels are congested and there is an effusion of serous fluid into the air spaces. The relationship to pulmonary congestion is close, and, indeed, clinically, such cases when unattended by any notable amount of expectoration, are usually termed pulmonary "congestion." To the clinician pulmonary œdema is only pulmonary œdema when there is ocular demonstration of it. This, it is almost needless to say, is a somewhat artificial distinction. Indeed, cases of œdema occur when from lack of expectoration the patient is actually drowned in his own fluid. As a matter of fact, congestion and œdema frequently go hand in hand, for both may be due to the same etiological factors. We see this for example in the cases associated with obstructive cardiac disease. Here, congestion of the lung is an inevitable result, though it may not for a long time bring about any notable disability. However, the tendency of cardiac patients to "catch cold" and suffer from bronchitis is an expression of this congestion, and the time comes, when loss of compensation sets in, that congestion passes over into transudation. Similarly, in inflammations, the preliminary congestion is quickly followed by exudation of plasma. When the congestion, of whatever nature, has passed into the stage that the lung cannot take care of it, the physiological has passed into the pathological, œdema has occurred, and it would be conducive to precision of thought as well as expression if we recognized this and spoke of "œdema" rather than "congestion," prefixing the terms "inflammatory" or "congestive," or others, as occasion requires.

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Acute pulmonary œdema may be conveniently discussed under two main heads, *symptomatic* and *idiopathic* cases. The symptomatic forms are relatively much the commoner, though, with the exception of the slighter cases, still somewhat rare. They are met with particularly in connexion with Bright's disease, pneumonia, cardiac failure, arteriosclerosis, aortitis and periaortitis, pulmonary embolism, the acute septic fevers, hyperpyrexia, after thoracentesis, and after anæsthesia. The idiopathic forms, called such for want of a better name, come on suddenly, without warning, and without obvious cause, and at autopsy no sufficient lesion is discovered to account for them.

From the standpoint of etiology we may divide cases of acute pulmonary œdema into five main groups, more or less well-defined one from another:

1. *Agonal:* This is undoubtedly the most common form, being found at practically every autopsy. It is the expression of a number of factors; general weakness, a failing heart, the recumbent position, sometimes inflammation, sometimes toxæmia. It is not the cause of death, but, as Cohnheim expressed it, it comes on because the patient is dying.

2. *Inflammatory:* This is often termed "collateral" œdema. It is usually local, and may be found in the neighbourhood of pneumonic and tuberculous patches, tumours, and infarcts. It is an early phase of all inflammatory processes in the lung.

3. *Congestive:* The typical example is met with in obstructive valvular affections of the heart, and wherever there is inadequacy of the cardiac muscle. The cases associated with hyperpyrexia, sun-stroke, and the acute fevers may with some reason be classified here. Respiratory failure, by lessening the propelling action of the thoracic movements may in some cases be a factor. We see this

sometimes in connexion with cerebral lesions. Local pressure on a branch of the pulmonary vein, as from an aneurysm or mediastinal growth, may also bring it about. Here, too, should be included the œdema of the lung with albuminous expectoration that sometimes occurs after thoracentesis.

4. *Toxic:* We meet this form notably in Bright's disease, though here it is difficult to exclude altogether the inflammatory element. Possibly, the postanæsthetic cases, as, also, those occurring in cachectic conditions and in the course of severe anæmias, ought to be included in this group.

5. *Idiopathic.* Here the condition comes on in a fulminating way and is so acute as directly and immediately to threaten life. Its etiology is largely a matter of guesswork.

Clinically regarded, several varieties may be recognized. The mildest type is that met with occasionally in typhoid and other prolonged fevers, and in early cardiac failure. A few fine crepitant râles make their appearance at the bases of the lungs, but no symptoms result. The sign should constantly be looked for wherever there is a likelihood of loss of cardiac compensation developing, for it is of great importance, not so much intrinsically, as for what it indicates.

In another group of cases the condition is a little more exaggerated: the râles are more numerous, more coarse and bubbling, possibly also sibilant, and associated with slight irritable cough and expectoration. It is often difficult to distinguish this variety from bronchitis.

In still another class the signs are more extreme: the râles are are more numerous, ronchial fremitus is present, cough is more frequent, a frothy pinkish fluid exudes from the mouth and nose. Dyspnœa is more urgent and cyanosis is marked.

The most severe of all is the acute fulminating form, also called, acute suffocative œdema, acute paroxysmal œdema. It comes on with great suddenness, often without warning, and in a short time the patient's life is brought into jeopardy. The physical signs are all aggravated. Large amounts of bloodstained fluid pour from the mouth and nose. Dyspnœa is extreme. Cyanosis, often with pallor, is notable. The pulse is small, rapid, and irregular. The attack often ends fatally, but may pass off as suddenly as it arose. Where recovery takes place, other seizures may occur later. Such fulminating cases usually depend on nephritis, cardiac failure, aortitis, arteriosclerosis, or, most rarely, on no obvious cause.

It is not my intention to deal with all these forms, but I wish to draw your attention more especially to the last two groups. And to do so the more efficiently, I will cite a few cases that came under my personal observation while in Montreal.

Case 1. J. H., male, aged fifty-five. Alcoholic and syphilitic: the subject of chronic Bright's disease. This patient, when I first saw him, was pasty looking and anæmic; had general anasarca, an enlarged heart, and high blood pressure. The urine was scanty, high coloured, and contained much albumin and many casts. Under suitable treatment the anasarca subsided, the urine increased and the albumin diminished. Then, without warning, the patient became maniacal and after some hours passed into coma. Hydrothorax developed on one side. Numerous moist bubbling and sibilant râles appeared all over the chest. Ronchial fremitus was marked with mucous rattling in the throat. A frothy fluid exuded from the mouth. Cyanosis became marked. The pulse became more rapid, weaker, and irregular, and the patient finally died.

Here we had to deal with a uræmic condition associated with marked œdema of the lungs. The case comes in the third clinical group detailed above. Pulmonary œdema of this grade, supervening without prodromal symptoms, in nephritis is, in my experience, not so frequent as the forms of lesser intensity which are common enough. Occasionally, the œdema affects mainly the bronchi—the "albuminuric bronchitis" of Lasègue. The most usual event is for the œdema to involve the bases of the lungs, precisely as in cases of cardiac failure, and it is part and parcel of a general anasarcous condition. Or, with the physical signs of œdema of the bases, which may persist for months, the patient may be the subject of so-called "asthmatic" attacks. In such cases, it has happened that the primary nephritis has been overlooked and the affection treated on erroneous lines. Rarely, nephritic patients are the subjects of the hyperacute or fulminating form of œdema, which comes on without warning and is so intense that it entirely dominates the situation.

Case 2. C. M., female, aged fourteen years. Previous history good: no rheumatism. A well developed and well nourished girl. The patient, who was a domestic, had been sent on an errand and had run part of the way. Immediately on returning she had been seized with cough, urgent dyspnœa, and became very ill. A doctor was summoned who ordered her to the Western Hospital. I saw her shortly after her arrival and about two hours from the beginning of the illness. She was semicomatose, but could be roused sufficiently to answer questions. Her face was pale and cyanotic: the limbs cold. A clammy sweat was present on the face. Dyspnœa was extreme and a small amount of pinkish froth was escaping from her mouth. The respirations were somewhat noisy: the pulse was rapid, small, and irregular. There was no œdema of the face, limbs, or trunk. Examination of the chest showed a considerable degree of enlargement of the heart to the left, with a loud systolic murmur replacing the first sound and transmitted into the axilla. The chest was full of loud sibilant sounds and rhonchi, with many bubbling râles. An examination of the urine excluded Bright's disease.

As the case was urgent, free venesection was performed, oxygen inhalations given, and strychnin and atropin were given hypodermically. Improvement gradually came about, the urgency of the symptoms slowly passed off, but it was nearly a week before the signs of pulmonary œdema disappeared. The area of cardiac dullness lessened somewhat but the murmur persisted. After three weeks she was discharged as recovered.

Here, the diagnosis was acute fulminating œdema of the lungs, secondary to mitral insufficiency. I may remark that in regard to pulmonary œdema occurring in cardiac cases we have an exact parallel with what occurs in Bright's disease. Slight œdema involving the bases of the lungs is common, and constitutes the first intimation of a failing circulation. Less often, we meet with a generalized œdema of the lungs, which may persist for weeks and is singularly resistant to treatment. One such case I have met with in association with mitral stenosis. Rarely, we meet with the acute fulminating type, as described in my second case. It comes on with great suddenness and is the first evidence of anything being wrong. This form may or may not be associated with general anasarca.

My next case is, so far as my information goes, absolutely unique, being one of acute fulminating pulmonary œdema occurring in a person apparently in good health, in whom no lesion could be found at autopsy to account for the condition.

Case 3. Mrs. P., forty-five years of age. Considered to be in perfect health. She was suddenly seized one night on retiring with an attack of suffocation. She asked her husband to get her a glass of water. When he returned she was black in the face, breathing with difficulty, and frothy blood tinged fluid was pouring from her mouth and nose. Between one and two pints of this material was eliminated during the attack. Death occurred from asphyxia within an hour of the time she was first seized. No cause could be assigned for the trouble, unless possibly it could be attributed to over-exertion, she having whitewashed a kitchen ceiling that evening. It was stated that about two years previous she had had a similar seizure which lasted only a minute or two, but was so severe that she was thought to be dying. This case occurred in the practice of a former colleague in Montreal, Dr. W. H. Smyth, to whom I am indebted for the history. The autopsy, which I performed myself ten hours after death, I give in some detail, in view of the importance of the case.

The body was that of a plump, well nourished woman. It was still warm and post mortem rigidity was complete. Varicose veins were present on the lower limbs, which were also slightly œdematous. Lividity was slight on dependent portions of the body. A somewhat brownish frothy fluid was exuding from the mouth and nose, the amount of which was increased on pressure upon the thorax. The abdomen was distended.

Heart: The apex was in the fifth interspace in the nipple line. The left ventricle was contracted firmly: the right ventricle was somewhat dilated. The right ventricle contained some fluid blood, which spurted out, apparently under pressure, on making a slit in the pulmonary artery. The left ventricle was empty and its cavity small. The tricuspid orifice admitted the tips of four fingers: the mitral orifice admitted one. The muscle of the left ventricle was thick and firm, showing no fibrosis. The foramen ovale was closed. The coronary arteries showed a trifling amount of sclerosis and were quite permeable. There was no pulmonary embolism.

Pericardium: Normal.

Aorta: Showed a very slight fatty change in the intima about the sinus of Valsalva.

Right Lung: The organ was adherent universally by old veil-like adhesions. It was heavy and pitted on pressure. Frothy blood stained fluid could be expressed readily in quantities from the bronchi. On section, the lung was generally congested and œdematous, the fluid, which was thin, watery, and blood stained, in all respects similar to that eliminated during life, running out freely.

Left lung: The left pleural cavity contained about two ounces of clear watery fluid. The lung was attached to the chest wall by one small fibrous tag anteriorly. The organ was in all respects similar to the right. Neither lung was friable.

Bronchi: Were filled with frothy fluid.

Pulmonary artery: Free from clot.

Peribronchial glands: Slightly enlarged and pigmented: no tuberculosis.

Trachea: Normal.

Larynx: Normal: no œdema of the glottis.

Spleen: Normal.

Œsophagus: Normal.

Stomach: Capacious, greatly distended with gas, containing about a pint of chyme.

Intestines: The jejunum and the upper three feet of the ileum were œdematous, but otherwise normal. The appendix was short and atrophied, lying on the brim of the true pelvis, coiled up behind the cæcum.

Pancreas: Normal.

Liver: Normal.

Right kidney: Of normal size: the capsule was very slightly adherent in places; a little congested in appearance. On section the organ cut as normally.

Left kidney: Normal, except for slight congestion.

Suprarenals: Normal.

Ureters: Normal.

Uterus: Parous in type. A few patches of congestion were found about the fundus.

Right ovary: Small, scarred, slightly prolapsed and adherent by old velamentous adhesions.

Left ovary: Small and scarred, enveloped in firm delicate adhesions.

Fallopian tubes: Both tubes were dilated in their outer halves and filled with clear fluid.

Microscopic examination was made of the lungs, heart muscle and kidneys. No abnormality was detected except in the former. The lungs showed congestion of the alveolar capillaries; a small amount of granular matter and a few erythrocytes with some desquamated endothelial cells were found in the alveolar spaces.

Anatomical diagnosis: Acute fulminating œdema of the lungs: slight hyperæmia of lungs: partial œdema of small intestines: slight coronary sclerosis: bilateral hydrosalpinx (slight): bilateral healed perioöphoritis: bilateral old pleural adhesions.

The autopsy in this case established the fact that a fatal œdema of the lungs can exist in the absence of any determinable pathological conditions to account for it. The usual causes, Bright's disease, cardiac failure, aortitis, and arteriosclerosis, were not found. The thymus gland was normally involuted and there was no evidence of any local pressure upon the heart or pulmonary vessels.

A good deal of attention has, in the course of the last few years, been paid to acute fulminating pulmonary œdema, particularly in English and American literature. This is, no doubt, due to the extraordinary character of the affection, its rarity, and the fact that it is so dangerous to life. The mechanism of its production is very puzzling. As we have already pointed out the condition may occur in connexion with certain grave disturbances, notably of the kidneys, heart, or bloodvessels, but also idiopathically in persons considered to be in good health. The characteristic features are the unexpected and acute onset, the absence of prodromata, the rapid development of signs of asphyxiation, the grave menace to life, and the tendency to recur, when recovery has taken place.

The amount of fluid expectorated or eliminated is sometimes extraordinary, as in my third case. A patient of Lissaman's also evacuated 1260 c.cm. within eight hours on one occasion, and had no less than seventy-two attacks in the space of two years and a half.

The attacks have a curious tendency to come on at night, and may last only a few minutes, but usually some hours, occasionally days. Death may ensue within an hour. The patients usually have a sense of impending dissolution.

The diagnosis of acute œdema of the lungs is usually easy. Perhaps the greatest difficulty is met with in the inflammatory cases. Here, the physical signs are those of bronchitis, bronchopneumonia, or acute suffocative catarrh. A discussion of the differences between these affections would be largely academic, for, practically, the treatment is the same. The presence of an inflammatory lesion such as bronchitis, pneumonia, or tuberculosis, with elevation of the temperature would point to the inflammatory type of œdema. In the absence of an inflammatory process we may diagnose simple œdema, if we find, in a nephritic or cardiac case, fine crepitations, or coarser moist râles at the bases of the lungs. If the bronchi in these areas be obstructed from exudation we get collapse of the lung, with resultant feeble or absent breath sounds and impairment of the percussion note. Cases may then be mistaken for pleural effusion. Care must be taken not to mistake the recurrent or paroxysmal type of œdema for asthma. The term "cardiac asthma," it may be remarked, is objectionable as it leads to confusion.

In the fulminant cases, the rapid onset, the signs of asphyxiation, the outpouring of pinkish frothy fluid from the mouth, and bubbling and sibilant râles are distinctive.

The prognosis varies according to the case. The slight forms, such as occur at the beginning of a cardiac breakdown, are unimportant in themselves, yet significant as fingerposts of danger. Timely recognition will often restore function to the heart and postpone the evil day. Inflammatory œdema in the case of pneumonia, affecting the same lung, is of grave significance: affecting the other lung it is prognostic of death. The outlook in the fulminating form is always serious, not only as regards the immediate attack, but for the future. Persons so affected are always in jeopardy.

Perhaps a word or two may not be out of place in connexion with the pathogenesis of this very curious and interesting condition. We can best understand the process if we recall the different factors that have been proved to be at work in similar conditions elsewhere. Three things, in particular, are of importance: the blood pressure, the capillary walls, and the character of the blood.

A sudden temporary increase of blood pressure probably does not bring about œdema. We know, however, that when the vascular tension is constantly increased, as, for example, where there is obstruction to the outflow of blood from a part, the plasma tends to escape from its normal channels. In the case of the lung, mere increase in blood pressure alone is not likely to bring about œdema by itself. We can hardly explain the sudden onset of the trouble in some cases on this basis. More likely we should invoke as well the influence of the lymphatic drainage system. Ordinarily the lung can take care of a moderate degree of plasma effusion. But, should the lymphatics be inadequate to carry off the overplus from any cause, œdema must needs result. Under the congestive form we must include the cases with albuminous expectoration that sometimes occur after paracentesis thoracis. Here the mechanism is somewhat complicated. A compressed lung is a congested lung. Its parenchyma is more or less inflamed. The vessel walls are damaged and to some extent paretic. You relieve the pressure suddenly, and a greater congestion still is the result, a great overplus of blood rushing into vessels that are but poorly prepared to receive it—the so-called congestion "by recoil." Here, too, we may place the cases occurring in hyperpyrexia and sunstroke, the high temperature bringing about cardiac failure through degeneration of the muscle. But another element possibly comes in. Owing to the imperfect aeration of the blood that occurs in congestion, the nutrition of the cells forming the capillary endothelium suffers, degeneration sets in, and the vessel wall becomes more permeable. Degeneration, moreover, would be more likely to occur in the inflammatory and toxic cases.

Another factor of importance is the nervous system. Vasomotor influences unquestionably play a part in inflammatory congestion, and it may be in other forms. It has been suggested that in pulmonary œdema we have a loss of vascular tone which leads to a paretic condition of the vessel walls, with resultant congestion and transudation. It is not impossible, nor even improbable, that just as we can have a pure vasomoter œdema of the skin and subcutaneous tissues, or of the larynx, there may be an analogous condition of the lungs—in short an angioneurosis. This might be compared to the acute abdominal tympany we sometimes find in neurotic women. It will be remembered that, in my third case, the abdomen was distended and a moderate œdema of the upper part of the small bowel was present. In the absence of a cardiac or nephritic lesion, it is difficult to explain the œdema of two such widely diverse organs as the lung and small intestine in any other than as a nervous phenomenon. I would suggest, therefore, that in the idiopathic cases we are really dealing with a form of angioneurotic œdema, though in doing so I am aware that I am going counter to the trend of opinion among physiologists on this point.

Alterations in the quality of the blood, which lessen its viscosity, or bring about degenerative processes in the vessel walls, conduce to œdema and even hæmorrhage. For example, we meet with œdema of the legs in chlorosis, pernicious anæmia, and various toxæmias.

Thus, we can readily understand that in any given case of pulmonary œdema a number of contributing factors may be at work. For example, in the form that sometimes follows ether anæsthesia, we probably have to do with an irritative congestion of the pulmonary capillaries, an increased permeability of the vascular endothelium of a degenerative and toxic nature, and an increased heart's action.

Welch's paper on the experimental induction of pulmonary œdema, published as long ago as 1878, is still a locus classicus on this subject and is frequently referred to. This observer did not think that enfeebled action of the whole heart, or passive hyperæmia from obstruction, was competent to explain the condition. He found he could produce pulmonary œdema by ligating the aorta and its branches, as, also, the pulmonary veins. The degree of obstruction required to produce this effect, however, could hardly ever occur in the human subject. Welch, further, was able to confirm the view of Cohnheim and Lichtheim that very great increase in the blood pressure in the aorta may occur with relatively little effect upon the intrapulmonary pressure. Moreover, the right ventricle is capable of overcoming enormous obstacles in the pulmonary circulation without material lowering of the aortic pressure. His final conclusion was that the essential feature was to be sought in "a disproportion between the working power of the left ventricle and of the right ventricle, of such a character that, the resistance remaining the same, the left heart is unable to expel in a unit of time the same quantity of blood as the right heart."

This disproportionate action of the two sides of the heart, with predominance of the right, may, of course, be brought about in different ways. Thus, Grossman found in cases of pulmonary œdema due to muscarine poisoning a condition of spasm, and not paralysis or paresis, of the left ventricle. Von Strümpell's idea was that there was a sudden failure of the left ventricle. Such may be the case where there has been a toxic action of any kind on the cardiac muscle. This is, as is well-known, more apt to involve the left side than the right. Welch's theory, while undoubtedly explaining some cases, cannot cover all. Disturbances of innervation, changes in the capillary endothelium, and qualitative changes in the blood can by no means be ignored.

As we have seen, the diagnosis of acute pulmonary œdema is usually easy. The treatment, however, is by no means so simple. One might infer from the multiplicity of remedies that have been advocated that none, perhaps, are of much avail. Rather, to my mind, does this indicate a realization of the varying etiology of the condition. Here, as elsewhere, a thorough grasp of the factors at work is essential to an efficient therapeusis.

The treatment of the milder forms complicating acute and chronic infections or intoxications, nephritis, cardiac disease, and arteriosclerosis, resolves itself largely into the treatment of the underlying condition. In many of these affections pulmonary œdema is a terminal event, and it may as well be admitted at the outset that the prognosis is grave and treatment is often ineffectual. Particularly is this the case with the pulmonary œdema met with in chronic nephritis. Here the condition is but one of the manifestations of uræmia and proves singularly refractory. The attacks occurring in connexion with cardiac failure are but little better, for if recovered from they are apt to return speedily. In cases, however, of sudden loss of compensation, as, for example, in acute dilatation of the heart occurring in one who has previously had few or no symptoms, judicious treatment may save the situation. In cases associated with arteriosclerosis the problem becomes very complicated, for we frequently have to deal with the effects of high blood pressure, cardiac insufficiency, and renal involvement. Here, what appears to be the most threatening feature must be combatted first. In the rare event of acute pulmonary œdema supervening in cases of hyperpyrexia one would naturally turn to cold packs or baths as a reasonable procedure. Having said so much, in a general way, to indicate some of the difficulties with which we are confronted, we may now profitably consider the treatment of the attack itself.

An attack of acute pulmonary œdema is an alarming affair. If conscious the patient is greatly distressed, and both looks and feels as if death were impending. If unconscious the danger is still more imminent. Treatment, to be of any avail, must be prompt and energetic, yet always guided by a rational appreciation of the conditions present. Timely and judicious interference will often save life. Tardy or inappropriate remedies may throw it away. The obstrusive feature of the condition is asphyxia, and this is due in part to the flooding of the air passages with fluid, and in part to the associated cardiac failure. It is practically impossible to attack the œdema directly, but we should relieve suffering and support the heart. How we ought to do this will depend upon the case. If the patient be in full possession of his senses, but agitated or fearful, and clearly suffering in both mind and body, small doses of morphine should be tried. Theoretically, morphine is contraindicated in acute œdema of the lungs, as in acute catarrh, as stifling cough and locking up secretion, thereby throwing more work upon a possibly already labouring heart. Yet good authorities like Riesman, Stengel, and Hewlett, bear witness to its usefulness, particularly in recurrent cases. It probably acts by alleviating the shock and mental disturbance incident to the attack, and by quieting and steadying the heart. The relief of the feeling of suffocation enables the patient to breathe more freely, moderates excessive action of the diaphragm, diminishing the amount of blood reaching the lungs, and lessening the consumption of oxygen by the respiratory muscles. In my opinion, however, it should be used with great circumspection and in the smallest dose that will produce the desired effect. In the severer cases, where large quantities of fluid are pouring from the mouth and nose, where the pulse is small and irregular, and the patient is with difficulty to be aroused, morphine should not be used. Atropin is not so powerful as morphin but, according to Stengel, may be advantageously combined with it, in doses of one two-hundred and fiftieth of a grain. As this drug depresses the vagus it should only be used in cases where the heart's action is strong, or where it is guarded by the exhibition of some cardiac stimulant. I have thought some benefit was derived from full physiological doses of atropin in cases of œdema occurring in uræmia. But this effect is usually but temporary. In cases of pulmonary œdema due to pilocarpin and to muscarin poisoning, atropin is the physiological antidote and should be pushed. Chloroform, advocated by Lissaman, has a somewhat similar action to morphine. It has been used with great success by some English physicians in the recurrent form of acute paroxysmal œdema.

Lowering of the head, so as to facilitate the removal of the fluid from the lungs has been found beneficial in cases due to pilocarpin and anæsthesia. This could not likely be put into practice in those cases due to heart weakness.

When cyanosis becomes evident oxygen inhalations will prove of great assistance. They relieve the air hunger and strengthen the heart's action. The gas should be used freely. In this way we gain time and allow other measures to bring about their effects.

High arterial tension is not uncommonly met with in those suffering from œdema of the lungs. In such cases the use of vasodilators, amyl nitrite and nitroglycerin, and similar drugs, has been advocated. It is, to my mind, questionable if anything is to be gained in this way. If one be a follower of James Mackenzie, one would, doubtless, take the view that a high blood pressure, when present, is a necessity, necessary, that is, to maintain an efficient circulation. If it be possible to materially lower the pressure, and of this there is some doubt, we may be doing harm in so doing. Possibly an exception to this position may be found in those cases of high blood pressure of toxic origin, which come on acutely. Even here, the tension may be reduced in a better way than by vasodilator drugs.

In my judgement the most efficacious remedy we have to combat acute pulmonary œdema is bleeding. Where the heart is dilated, and contracting rapidly and irregularly, and therefore inefficiently, this procedure is particularly indicated. If uræmia or other intoxication be present it is useful to remove the deleterious products. If the blood pressure be high we can remove with safety eight or ten ounces, West says twenty to thirty. Low blood pressure is not a contraindication, unless the patient be actually *in articulo*. Only, in the presence of low blood pressure we should remove less. The low tension may be an indication of an overfilled and struggling heart. The removal of a small quantity of blood removes part of the load of the heart, allows it to contract towards its normal limits, and thereby conserves its energy, and promotes its action. Here, in addition, cardiac stimulants, such as strophanthin intravenously, (gr. 1/120th to 1/60th), camphor, or strychnine should be employed. If on account of severe anæmia it be deemed unwise to bleed, recourse may be had to ligation of the lower extremities. Broad rubber bands are applied to the upper part of the thighs and just sufficient pressure is made to impede the venous return without interfering with the arterial supply. Tabora has shown that this procedure will reduce an excessive venous pressure, and that it may cut short the pulmonary œdema that sometimes develops in the course of pneumonia. The bandages should be removed very cautiously in order to obviate a sudden rush of blood from the extremities to the heart and lungs.

When recovery has taken place attention should be directed to removing as far as possible the underlying cause, such as nephritis, cardiac insufficiency. Appropriate diet for these conditions should be prescribed. Chloride of sodium should be restricted as much as may be. Drugs like iodide of potash, adrenalin, and pilocarpin should be interdicted. Finally, fatigue, worry, excitement, overexertion, dietetic indiscretions, should be avoided. This will do much to avert further attacks.

Case Reports

A CASE OF SEVERE PHARYNGITIS IN ASSOCIATION WITH ERYSIPELAS

By H. S. Muckleston

Montreal

ERYSIPELAS is no stranger to the man engaged in the treatment of ear, nose and throat diseases. Attacking the skin of the face, as it very commonly does, it has as its starting-point in many cases the ala nasi, and less often the external ear.

It can complicate the course of otitis media, rhinitis, accessory sinus infections, or other inflammatory conditions. It then constitutes clinically a new or added disease, seemingly independent in its course of the primary ailment; it tends to militate against the primary healing of sutured wounds, and to retard the closing in of granulating wounds. It arouses in the surgeon's mind grave disquiet as to his operating technique, and he awaits its disappearance with anxiety, that the primary condition may then have nature's best efforts directed to its betterment.

There is, however, another phase of erysipelas to which I wish to turn your attention in this paper. In the course of an acute, severe inflammation of some part of the upper respiratory tract, erysipelas of the face at times makes its appearance, sometimes as an extension by continuity of the original infection, sometimes in parts relatively remote. It is as if the primary infection took hold upon a new area, and not as if a new and complicating ailment presented itself.

Some authors divide the acute infections of the pharynx and larynx into classes or subdivisions, and use the word "erysipelas" in their categories. Bruck's description, for example, I may summarize thus,—high fever, pain, shiny and œdematous mucous membrane, sometimes bullæ, with a tendency for the disease to extend to the adjoining parts or to the outer skin; or the origin

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may be external, and the disease extend inwards. Struempell also recognizes a Schleimhauterysipel.

Semon set himself against this refinement of classification, in a paper entitled, "On the probable pathological identity of the various forms of acute septic inflammations of the throat and neck, hitherto described as acute œdema of the larynx, œdematous laryngitis, erysipelas of the pharynx and larynx, phelgmon of the pharynx and larynx and angina Ludovici."

In medical publications, general and special, there is an abundance of material submitted, wherein the writers present reports of grave pharyngeal and laryngeal infection, resulting all too often fatally. The association of severe pharyngeal inflammation and erysipelas of the skin is not so often reported as to make it a commonplace. I trust you will not count the report of such an association unworthy of a place in these proceedings.

On March 21st, 1914, I was called at 6 a.m. to see Mr. G. W., the physician, Dr. Morgan, asking me to go prepared for a case of quinzy; Mr. W. had fallen ill on the 17th, with what was regarded as an influenzal attack; pain in the throat, and difficulty in swallowing had begun the day before I saw the patient. I found Mr. W. sitting up in bed, with temperature 101°, complaining of pain in swallowing, extreme dryness of the throat, and of feeling something that blocked up the passage; he had been unable to sleep that night, and had so much difficulty in speaking plainly that he by choice replied to questions in writing. He had had no chill. Examination of the nose showed nothing of note; there was a septal deflection, and the turbinates and meatuses were normal. The tongue was dry and blackened, the soft palate and anterior pillars swollen and deeply congested, the palate being dry and ridged, with strings of thick mucus sticking to it; the uvula was greatly swollen, being in size equal to a man's little finger, with scattered petechiæ, and a single large bulla near the tip: the tonsils were congested, but not displaced towards the mid-line; the posterior pillars were swollen and deeply reddened, the swelling extending down the sides of the pharynx to the level of the epiglottis. Except for moderate congestion and slight rounding of the epiglottis, the larynx was free.

The patient complained also of pain below the right ear: there was a palpable gland behind the ramus of the lower jaw. There was no ear-ache or deafness.

Free scarification of the uvula gave marked relief, and the patient could swallow more easily; this was in part attributable to my use of 10 per cent. cocaine, but not wholly, as this improvement lasted all day.

The evening of the same day, I was called from a meeting to see Mr. W., because he had suddenly become deaf, and there was a discharge from the right ear. I was greatly humiliated at not having looked into the ears in the morning, but was much relieved to find that the deafness and discharge were due to hæmorrhagic bullæ on the meatal wall; one had already burst, and when I punctured the second and cleaned out the canal, I saw the drum membrane of normal lustre, and but slightly injected. The throat condition was somewhat easier, but the pain below the ear more severe; there was some swelling of the auricle.

I did not see the patient again. He lived in one of the suburban towns, and I learned by telephone of his progress. The following day there was a pronounced redness and swelling of the auricle and cheek, but a continued improvement in the pharyngeal inflammation. I communicated with Dr. Morgan, and told him that I was convinced that the skin condition was erysipelas. The later course of the illness justified my diagnosis, for the infection spread to the scalp, and across the head; then down the right side of the neck to shoulder and right arm. There was decided hyperpyrexia, and for some days delirium, but ultimate recovery.

Without the external evidence of erysipelas, I should hesitate to apply the word "erysipelas" to a pharyngitis or laryngitis: I have had in my practice cases of grave infection, for which no word short of "phlegmon" or even "gangrene" could satisfy. Semon reported in his paper fourteen cases of his own, in order of increasing severity: as it happened, none of them seems to have shown erysipelatous signs outwardly.

Reiche and Schomerus have reported a series of thirty-one cases of pneumococcic infection of the throat, grading them, as did Semon, according to severity. Of these eight were severe, and of the eight, two died. Erysipelas developed in one of the two fatal cases, and in one other; in a third there was redness and swelling of the neck, with emphysema. I should like to summarize the report of one of the fatal cases; she was a woman in the last month of pregnancy, who developed a pneumococcic pharyngitis with dyspnœa; labour began on the second day, and terminated on the third; erysipelas developed on the third day; the child died when three days old, and the mother two days later. Pneumococci were recovered in culture from the bullæ of the skin, from the larynx, the tonsils (here in company with streptococci), and also from the blood of the child.

Leube, of Wuerzburg, has reported a case which bears on the subject: a young woman, suffering from pneumonia, developed facial erysipelas, the ala nasi being its starting-point: from the bullæ on the affected area, pneumococci were grown in pure culture. Leube ascribes the infection to pneumococcus-laden sputum.

Still more pertinent is the series of three cases reported by Delavan; the diagnosis in each case was erysipelas of the pharynx or larynx, and each developed facial involvement, the redness starting at the lips or the nose. The second of his series went through stages of profound toxæmia to delirium, and finally permanent insanity.

Mental symptoms were present in my own patient, and in one of those reported by Semon; this latter patient became violent in his delirium, and attempted suicide; his attempt was unsuccessful, but he died suddenly the following morning.

The fact that the erysipelas showed itself in my case first at the auricle adds to it an otological interest. I have seen erysipelas of the meatus and auricle six times, but so far as I can recall, this one alone had a throat infection as its primary cause. The path of infection would seem to have been through the retro-pharyngeal and deep cervical lymphatic glands.

Though the streptococcus is accepted as the common infecting agent in erysipelas, the power of the pneumococcus to set up what is clinically the same disease is shown by the findings of Reiche and Schomerus and of Leube.

In those cases where the reports were given in sufficient detail, the outward signs of erysipelas succeeded the inward, and appeared on either the third or the fifth day. Cornil, however, published reports on eighteen cases fifty years ago, in half of which the facial eruption was primary, and in the remaining half secondary; of the nine cases where the extension was from without inwards there were seven deaths, and of the nine where the reverse took place there were two deaths. Of the six patients whose reports have been at my disposal, one died, one became permanently insane, and the others recovered. Where recovery did take place, it is of interest that usually the beginning of the facial erysipelas was approximately synchronous with the first alleviation of the throat symptoms.

I cannot do better than repeat Delavan's apt quotation from the writings of Hippocrates. "When erysipelas extends from within outwards it is a favourable symptom, but when it removes from without to the internal surfaces it is a deadly one."

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IT is announced that fifty ambulances given to the French Government by the French Relief Committee of Great Britain, were lost when the vessel which was conveying them to France was torpedoed. It is expected that they will be replaced at once through private contributions.

AN outbreak of diphtheria occurred in the north end of London at the beginning of October. The cases were confined almost exclusively to children. Prompt measures were taken with the result that no further cases developed. An outbreak of the same disease occurred in Hamilton and in one neighbourhood two or three deaths occurred amongst school children. The children of this neighbourhood were inoculated and the outbreak was soon quelled.

Editorial

THE PREVENTION AND CONTROL OF CANCER

CAMPAIGNS for the prevention and control of cancer have been carried on in recent years with much activity and vigour by special societies and public bodies. Like all popular enterprises which have for their purpose the enlightenment of an ignorant laiety on difficult scientific and technically intricate subjects, they present a good and a bad side.

If it is their purpose to acquaint the masses with well recognized facts and scientifically founded ideas regarding the origin, cure, and possible prevention of this dreadful disease, they are to be welcomed and to be highly commended.

If, on the other hand, they serve to spread, under a pseudo-scientific cloak, personal views or uncertain rumours, the true value of which cannot be properly judged by the average person, then such movements must be condemned not only as unscientific, but as dangerous.

A great deal of mischief has already been done by the scientific and lay press in regard to the question of increased mortality from cancer. By many it is now assumed to be a fact that deaths from cancer are increasing, but in reality we are far from knowing anything definite about it. American statistics are quite useless for this purpose; partly for technical reasons, which were presented in great detail and thoroughness by Dr. E. F. Bashford (Middleton-Goldsmith Lecture before the New York Pathological Society, in 1912; also a later article in the *Lancet* on "Fresh claims in the increase of cancer," February 7th, 1914); and partly because the training in pathological anatomy and histology in the United States has been so wretchedly poor that even the diagnosis of cancer on the death certificate has been a more or less uncertain quantity (see Oertel—"The inaccuracy of American mortality statistics"—in the American Underwriter, May, 1913, vol. 39, p. 137; and Graham Lusk—"Medical education in the United States," read before the Seventeenth International Medical Congress, London, 1913, and published in *Science*, vol. 38, October 10th, 1913).

Even in European countries, where statistics have been kept in the past with much greater accuracy and care, it has only in recent years become possible to record and compute them in a manner which makes them useful in this regard. (See "On changes in the recorded mortality for cancer, and their possible interpretation," by Major Greenwood, Jr., and Frances Wood, in "Proceedings of the Royal Society of Medicine, 1914," vol. 7, section of epidemiology and State medicine —with following discussion).

Thus we must warn against a present view, prevalent even amongst physicians, that an increase in cancer mortality has been definitely shown.

More directly harmful, however, are activities on the part of certain cancer hospitals and specialists, which have for their purpose the diffusion of their personal views on a specific treatment of cancer. We have before us at this writing a fly-leaf, distributed by a well recognized and well reputed Metropolitan skin and cancer hospital, entitled "Directions for cancer patients."

Amongst these directions there appear:

"It is not necessary to operate on every cancer. *X*-ray and radium are often of value, and the disease may disappear and remain absent under proper dietetic and medical treatment.

"This treatment consists in an absolutely vegetarian diet, with continuous proper medication, for a long time.

"To get favourable results, this treatment should be kept up strictly, until discontinued by the physician.

"To assist in carrying out a strictly vegetarian diet, a diet list for cancer is here given, which should be closely adhered to. Coffee, chocolate, and cocoa, as also alcoholic drinks, even beer, are harmful, and must be avoided. The rules given at the end are also strictly to be observed."

Then follows a remarkable vegetarian diet list, which, in all probability, would shortly so disgust any cancer patient as to lead him to pray for his speedy demise. On the last page of the leaflet we are further enlightened by the statement that it is desirable for cancer patients to eat the skin of potatoes, and one or two other equally interesting and important directions.

Such activities, emanating from well reputed institutions and persons, are much to be regretted, and they are detrimental, not only in themselves, but because they injure and degrade the activity of those who sincerely endeavour to obtain a truthful and reliable public enlightenment.

Our attitude in no way detracts from, or is intended to minimize, the importance of the matter, but it considers that, even in popularizing scientific subjects, strict adherence to well established facts and elimination of all matters still unsettled and under discussion, is the best policy.

THE MEDICAL SCHOOLS

THE work of the session 1915–1916 is now well under way in all our Canadian medical schools. As was to be expected, the war has had its effect upon the activities of these institutions. Fewer enrolments are reported from all the schools. For instance, at the University of Toronto, 507 students have registered this year in the medical faculty as compared with 568 last session; at McGill University, 222 as compared with 394; and at Manitoba College, 108 as compared with 180. This reduction is due not so much to a falling-off in the first year, the members of which may be said barely to have reached the age for military service, as to the enlistment of numbers of the senior students, who were already fitted to do effective work in the various medical organizations.

The inroads upon the staffs of the various schools have been relatively even more marked; for, in addition to the men attached to the regular army medical service, the full complements of the university hospital units have necessarily been furnished by these bodies. Notwithstanding this, the teaching work as a whole has not been seriously interfered with, although in some departments, through the reduction of the staff, a great deal of extra work has devolved upon those who remain.

For reasons other than the war, the present session will be remembered as noteworthy in some of our schools. The first session at the Institute of Public Health, which was established as the Public Health Faculty of Western University by the Ontario Government, was inaugurated on October 1st. This course, open only to graduates in medicine, consists of a winter session of eight months devoted to advanced laboratory and contagious hospital work; followed by a summer course of three months during which the candidates act in rotation as assistants to the professors in the department, who are *ex-officio* heads of the board of health of the city of London. In the medical faculty courses are being given in comparative anatomy and biology by Professor A. D. Robertson, and in physics by Professor E. F. Barker, newly appointed to these chairs. During the summer a physical laboratory was established and equipped and in other departments new equipment was added. A business office for the school has also been provided.

At Dalhousie University, the faculty of medicine is now housed in the old university building, the faculties of arts and science having moved out to the new buildings on the Studley estate, a beautiful situation close to the North West Arm. The faculties of law, medicine, dentistry, and pharmacy share the large old college building, which provides ample accommodation for the laboratories. Especially have anatomy and physiology benefitted by this change. The laboratories of histology and the new dissecting rooms are particularly well lighted.

This year the University of Alberta is giving the first three years of a medical course instead of two as previously. Arrangements have been made with the Universities of McGill and of Toronto to accept students without examination at the conclusion of a three years' course, so that they may take their fourth and fifth years in the east. It is hoped, however, that next autumn the university may itself be able to provide the additional two years. At the Medical College of Manitoba one year's work in science is now required for admission to medicine.

A CONFERENCE took place at Ottawa, on October 18th, between the representatives of the Military Hospital Commission and the premiers of the provinces. A recent amendment to the Order in Council by which the Commission was appointed, empowers that body "to deal with the question of employment for members of the Canadian Expeditionary Force on their return to Canada, to coöperate with provincial governments and others, for the purpose of providing employment as may be deemed necessary." The Commission has already taken steps to arrange for convalescent homes for those returning from the front who require a period of rest in order to regain the health they have lost, and at the recent conference a statement was submitted, prepared by the secretary of the Commission, in which was set forth a plan whereby the question of employment, not only for disabled men, but for able-bodied as well, on their return to civil life, could be carried out. Appendices were added to this statement giving particulars of the steps which have been taken in Great Britain and on the Continent of Europe to meet the situation there. On behalf of the provincial governments, the ministers expressed entire willingness to do the utmost in their power to assist the work of the Commission. Enquiries will be instituted concerning the facilities offered in each province, and a report made to Ottawa. It is probable that provincial commissions will be appointed, which in turn will appoint local committees, and that arrangements for the reception and training of members of the Expeditionary Force will be made with universities, technical schools, agricultural colleges, schools for the blind, etc., and with sanatoria for those who are suffering from tuberculosis.

A LAW has recently been adopted by the provincial government of Saskatchewan, whereby the sum of $25 will be paid to a mother each time she gives birth to a child and $15 to the physician who attends her.

UPPER LODGE, the beautiful royal domain at Bushey Park, Surrey, has been offered by His Majesty the King to the Canadian Red Cross. The offer has been accepted by General Carleton Jones on behalf of the Canadian Medical Service, and the house will be furnished and equipped as a convalescent home at once under the direction of Colonel Hodgett. It will be called the Princess Mary's Canadian Red Cross Convalescent Home and will be equipped with three hundred beds.

AN interesting article on "The English side of medical education," by Mr. Abraham Flexner, appeared in the October issue of the *Atlantic Monthly*, in which a comparison is drawn between the English and the German methods of teaching. The pros and cons of each method are considered by Mr. Flexner, who arrives at the very proper conclusion that the way of improvement lies in a combination of the clinical and university systems of teaching.

THE following resolutions were unanimously adopted by the House of Delegates of the Medical Society of the State of Philadelphia on September 22nd, last: "*Whereas*, an important drug, necessary for the cure of disease and likewise the prevention thereof, is no longer available to the medical profession of this country by reason of the European war, and, *whereas* this drug has been produced in this country, but cannot be supplied to physicians because its manufacturer is protected by patents, therefore, be it *resolved* by the Medical Society of the State of Pennsylvania that the Secretary of the Interior or the Commissioner of Patents be respectfully urged to call upon the patentees to supply this drug or permit the same to be supplied by others, or to take such other means as his judgement may dictate to relieve the existing condition." Salvarsan, as well as other arseno-benzol products, has been prepared in the Dermatological Research Department of the Philadelphia Polyclinic by Drs. Schamberg, Raiziss, and Kolmer during the past year, and over one hundred injections of the drug have been given to hospital patients with excellent therapeutic results and without untoward effects.

THE tale of horror is not yet complete. The execution of Miss Cavell, at Brussels, is another instance of German brutality. An Englishwoman and a nurse, Miss Edith Cavell was head of a training school in Brussels. When that city fell into the hands of the Germans, she voluntarily remained there and devoted herself to nursing the wounded, whether English, French, Belgian, or German. On August 5th, last, she was arrested by the German authorities and charged with assisting English, French, and Belgian soldiers to escape from Belgium. A court martial was held and sentence of death was passed on October 11th, despite every effort on the part of the American and Spanish ministers at Brussels to save her life. Shortly before two o'clock on the morning of October 12th, a party of six men and an officer was drawn up in a walled-in yard to await Miss Cavell, who was blindfolded. She stepped bravely forward until her strength failed and she fell in a swoon thirty paces from the wall where she was to have been shot. The officer advanced and, in cold blood, shot her through the head as she lay unconscious on the ground. It is superfluous to make further comment.

In his second dispatch, Sir Ian Hamilton made the following comment on the difficulties encountered by the medical services in the Dardanelles: "The Royal Army Medical Service have had to face unusual and very trying conditions. There are no roads, and the wounded who are unable to walk must be carried from the firing line to the shore. They and their attendants may be shelled on their way to the beaches, at the beaches, on the jetties, and again, though I believe by inadvertence, on their way out in lighters to the hospital ships. Under shell fire it is not as easy as some of the critically disposed seem to imagine to keep all arrangements in apple-pie order. Here I can only express my own opinion that efficiency, method, and even a certain quiet heroism have characterized the evacuations of the many thousand of our wounded." The medical arrangements for dealing with the sick and wounded are entirely in the hands of the Royal Army Medical Corps, but the naval authorities control the working of the ships, of which there are fifty, through a naval hospital transport officer.

In the June number of the *North American Review*, Dr. McLane Hamilton, discussing the mentality of the Kaiser, declares him to be "a menace to the world, for the reason that he not only has shown the exceedingly bad judgement that belongs to those who are mentally inferior, but has delusive ideas of grandeur and consequent power of persecution and conspiracy." In "The Pyschology of the Kaiser," Dr. Morton Prince attributes the mental state of this modern Caligula to a subconscious phobia—a fear of democracy. On page 327 of *British Medical Journal*, issue of August 28th, a review of Dr. Cabanès' "History of the Hohenzollerns" is given. In stigmatizing the Hohenzollerns as a "Dynasty of Degenerates" Dr. Cabanès perhaps has gone too far, as the Editor so ably points out on page 331 of the same issue of the *Journal*. The question is of more than scientific interest: it has acquired a human significance through the lives that have been sacrificed in the present conflict.

Book Reviews

THE TONSILS, FAUCIAL, LINGUAL, AND PHARYNGEAL, WITH SOME ACCOUNT OF THE POSTERIOR AND LATERAL PHARYNGEAL NODULES. By HARRY A. BARNES, M.D. Illustrated. Price, $3.00. St. Louis: C. V. Mosby Company, 1914.

This book presents in a clear and interesting form a résumé of our present knowledge about the tonsils. The development and anatomy are described and what is known of the functions discussed. The pathological and clinical features are of particular interest and are treated in a very satisfactory manner. The work is fully illustrated with microphotographs and drawings, which are good and add much to the interest of the text. The author is to be congratulated upon his excellent work.

TEXT-BOOK OF MEDICAL CHEMISTRY AND TOXICOLOGY. Fourth edition. By JAMES W. HOLLAND, A.M., M.D., Sc.D., emeritus professor of medical chemistry and toxicology, and Dean, Jefferson Medical College, Philadelphia. W. B. Saunders, Philadelphia and London, 1915. Price, $3.00 net. Canadian agents: J. F. Hartz Company, Limited, Toronto.

THIS is a book of six hundred and fifty pages and index, with the addition of several coloured plates. Its contents are divided into, Introduction—metrology, heat, magnetism and electricity, and light, sixty-one pages; The Chemical Elements—non metals and metals, three hundred and two pages; Organic Chemistry, one hundred and eighty-four pages; Physiologic Chemistry, one hundred and three pages. The author describes under metrology the various units of weight and measure, and specific gravity. Under heat he takes up thermometry, specific heat, freezing, boiling and evaporation, indicating briefly the application of the Le Chatelier principle and the phase diagram. In the section on electricity and magnetism the various battery cells are described, also the principles of the induction coil and the methods for the production of cathode and Roentgen rays; whilst under light is included an account of the methods of polarimetry and spectroscopy.

The systematic treatment of the elements commences with the study of oxygen, ozone, hydrogen, water and hydrogen dioxide, and illustrations are given of reversible processes, mass action, chemical equilibria, intrinsic energy. Then follows a chapter on solution, diffusion, dialysis and osmosis. After discussing nitrogen and the atmosphere and carbon and its oxides, the author proceeds to state the atomic and molecular constitution of matter. Avogadro's Law is deduced from the behaviour of different gases under changing temperature and pressure. From this we are led up to Gay Lussac's law of combining volumes which is summarized in the following forms, "gaseous elements combine in equal volumes for their respective atomic weights."

The treatment of the elements and compounds may be illustrated by the case of iodine which is discussed under the following paragraphs: occurrence, preparation, physical properties, chemical properties, starch iodide, iodides, incompatibles, medical uses, toxicology, symptoms, fatal dose, fatal period, treatment, post-mortem appearance, detection, iodism, hydrogen iodide, U.S.P. preparations, oxyacids.

The cyanogen group and oxalic acid are treated under the non metals. A table of the elements is given in which elements of the same valence are grouped together with the atomic weights in arithmetical progression. This lacks many of the best features of Mendelejeff's table, and does not appear to have any advantages over the latter. A final group has to be reserved for metals that will not fit in anywhere else and in this group copper, silver and gold appear along with the iron and platinum families.

The discussion of the organic compounds follows the usual kind of sequence except that the aliphatic amines and amides are left out till the end of the aromatic series when a chapter follows on ammonia derivatives including aliphatic amines, amides, urea, amido acids and alkaloids There follow sections on ptomaines, toxins, proteins, ferments. The physiological section includes energy of foods, digestion, saliva, gastric and pancreatic juice, bile, intestinal juice, blood, faeces, milk, and urine.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

PRACTICAL MEDICINE SERIES. Edited by CHARLES L. MIX. Chicago, Year Book Publishers, 1915. Vol. V, PEDIATRICS; ORTHOPEDIC SURGERY. Edited by JOHN RIDLON, A.M., M.D., professor of orthopedic surgery, Northwestern University Medical School, with the collaboration of CHARLES A. PARKER, M.D. Price $1.35.

TEXT-BOOK OF SURGERY, FOR STUDENTS AND PRACTITIONERS. By GEORGE EMERSON BREWER, A.M., M.D., professor of surgery at the College of Physicians and Surgeons, Columbia University, New York; assisted by ADRIAN V. S. LAMBERT, M.D., associate professor of surgery, College of Physicians and Surgeons, Columbia University; and by MEMBERS OF THE SURGICAL TEACHING STAFF OF COLUMBIA UNIVERSITY, third and enlarged edition, thoroughly revised and rewritten Lea & Febiger, Philadelphia and New York, 1915.

INDEX OF PROGNOSIS, AND END-RESULTS OF TREATMENT. By VARIOUS WRITERS. Edited by A. RENDLE SHORT, M.D., B.S., B.Sc. (Lond.), F.R.C.S. (Eng.), Hunterian professor, Royal College of Surgeons. Bristol: John Wright & Sons, Limited. London: Simpkins, Marshall, Hamilton, Kent & Company, Limited. Toronto: The Macmillan Company of Canada, Limited, 1915.

FRACTURES AND DISLOCATIONS, DIAGNOSIS AND TREATMENT. By MILLER E. PRESTON, A.B., M.D., first lieut. M.R.C., U.S.A., with a chapter on RONTGENOLOGY. By H. G. STOVER, M.D., professor of rontgenology, School of Medicine, University of Colorado. St. Louis: C. V. Mosby Company, 1915.

OPERATIVE GYNÆCOLOGY. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., associate in gynæcology, Washington University Medical School, and associate gynæcologist to the Barnes Hospital. St. Louis: C. V. Mosby Company, 1915. Price $7.50

THE BIOLOGY AND TREATMENT OF VENEREAL DISEASES, and THE BIOLOGY OF INFLAMMATION AND ITS RELATIONSHIP TO MALIGNANT DISEASE. By J. E. R. MCDONAGH, F.R.C.S., surgeon to out-patients, London Lock Hospital. London: Harrison and Sons, 45 Pall Mall, S.W., 1915.

THE ETIOLOGY OF TYPHUS EXANTHEMATICUS. By HARRY PLOTZ, PETER K. OLITZKY, and GEORGE BAEHR, from the pathological laboratory, Mount Sinai Hospital, New York. Reprinted from The Journal of Infectious Diseases, Vol. 17, No. 1, July, 1915, pp. 1-68.

HANDBOOK OF PHYSIOLOGY. By W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S., professor of physiology, King's College, London. Twelfth edition, with nearly 600 illustrations in the text. Philadelphia: P. Blackiston's Son & Company, 1012 Walnut Street, 1915. Price, $3.00 net.

DISEASES OF THE NERVOUS SYSTEM: A TEXTBOOK OF NEUROLOGY AND PSYCHIATRY. By SMITH ELY JELLIFFE, M.D., Ph.D., adjunct professor of diseases of the mind and nervous system, New York Post-Graduate Medical School and Hospital; and WILLIAM A. WHITE, M.D., superintendent of the Government Hospital for the Insane, Washington, D.C., professor of nervous and mental diseases, Georgetown University. Illustrated with 331 engravings and 11 plates. Lea & Febiger, Philadelphia and New York, 1915.

POTTER'S COMPEND OF HUMAN ANATOMY. Revised by D. GREGG METHENY, M.D., L.R.C.P. and S. (Edin.), L.F.P.S. (Glasgow), associate in anatomy, Jefferson Medical College, Philadelphia. Eighth edition, with 139 illustrations; also numerous tables and 16 plates of the arteries and nerves. Philadelphia: P. Blackiston's Son & Company, 1012 Walnut Street, 1915. Price, $1.00 net.

TRANSACTIONS OF THE AMERICAN UROLOGICAL ASSOCIATION: THIRTEENTH ANNUAL MEETING AT PHILADELPHIA, PENN., JUNE 18TH, 19TH, 20TH, 1914. Publication Committee: HUGH CABOT, RICHARD FROTHINGHAM O'NEIL, GEORGE GILBERT SMITH. Printed for the Association at the Riverdale Press, Brookline, Mass., 1915.

COLLECTED CONTRIBUTIONS, (a) PSYCHOPATHIC HOSPITAL. Department of the Boston State Hospital. Whole numbers 35-63 (1914.1-1914.29). (b) STATE BOARD OF INSANITY. Whole numbers 21-34 (1914.1-1914.14). 1914, Boston, Mass.

AIDS TO PHYSIOLOGY By JOHN TAIT, M.D., D.Sc., lecturer in experimental physiology, Edinburgh University; and R. A. KRAUSE, M.D., D.Sc., lecturer in hygiene, College of Hygiene and Physical Education, Dunfermline. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1915. Price, 3s. net.

THE NEW PSYCHIATRY. Being the Morison Lectures delivered at the Royal College of Physicians of Edinburgh in March, 1915. By W. H. B. STODDART, M.D., F.R.C.P., lecturer on mental diseases to St. Thomas's Hospital. Publishers: Baillière, Tindall & Cox, 8 Henrietta Street, Covent Garden, London, 1915. Price, 3s. 6d. net.

THE first official list of casualities in the Canadian Expeditionary Force was issued October 25th. The figures are complete up to October 16th last. Total number of casualties, 15,187; killed in action, 94 officers, 1,625 men; died of wounds, 25 officers, 654 men; died of illness, 6 officers, 172 men; accidently killed, 2 officers, 38 men; prisoners of war, 56 officers, 1,251 men; missing, 32 officers, 1,110 men; wounded and ill, 467 officers, 9,660 men. The figures given for those wounded and ill include all who have passed through the field hospitals, many of whom were able te return to their regiments in a very short time.

Res Judicandæ

WORK FOR THE AGED PHYSICIANS*

By John Hunter, M.B.

Toronto

MEN grow old in two ways, chronologically and physically, but these are by no means necessarily synchronous. Dr. A. was born away back in the thirties, or forties, of the past century, and we say that he is getting to be a pretty old chap, while we speak of Dr. B. as an old man because he is frail, though his birthday may date much later than Dr. A's. There are many of the Dr. A. class in our ranks. What special use can be made of their strength and vim?

Three courses are open to the aged physicians. (1) They may continue their vocation as long as mentally and physically fit. (2) They may retire and simply "mark time" as best they can. (3) They may seek a new vocation. The first of these, though ethical and laudable, has its handicaps, for as "life runs on the road seems strange with methods new." The aged physician feels disinclined to take up much new work since he knows that his time must be too short to master the many innovations pressing for recognition. The knowledge and skill required for the *x*-ray, radium, catheterization of the ureters, preparation of serums, bronchoscopy, the Wassermann reaction, blood pressure, spinal puncture, etc., seem scarcely worth the effort at his stage of life. The loss of congenial companions is keenly felt, and to this must be added the disabilities incident to impaired memory, hearing, and sight. His families change too, for in many of them there are no longer any children to require attention, hence his income is an ever diminishing one. The second course, viz., simply to "rust out" is quite tragic, for, by willingly adopting it, one withdraws from the use of his patients the knowledge he has acquired from study and observation and also the experience he has obtained in practice. The third course, viz., a change of vocation, is beset

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* Received for publication, September 27th, 1915.

with many pitfalls. The physician may invest his savings in some enterprise with which he is not familiar and lose all.

The writer, in the limited space at his disposal, can only outline somewhat crudely a new field that is open to all our medical veterans. It is one that might prove a very pleasant and useful pastime. It is a special form of research work, namely, to undertake to review whatever medical literature they have access to and to record their own most interesting experiences. In every village, town, and city throughout the Dominion, the aged physicians in that area could meet and bring their contributions. These could be compared and selections made of those most representative of the medical culture and experience of that community. These selections could be forwarded to a provincial committee to be kept on file in a library and used by the local medical journals. The provincial committees could be instructed to make selections from the contributions sent to them and to forward these to a Dominion organization for the purpose of having final selections made for publication. While it would be the fate of most of the contributions not to reach the printing press, yet every contributor would have the satisfaction of knowing that his contribution had been heard or read by a number of his confrères and that his work had not been in vain. The volumes that would be published at stated intervals would be thoroughly representative of Canadian medical culture and experience.

The reader may ask what good could be accomplished by this addition to our present supply of medical literature. Have we not a superfluity of medical books and journals now? Are not our book-shelves overburdened with stuff that we cannot possibly find time to read? The very fact that such a condition exists is proof positive that "it is time for a change." The busy man is certainly getting a very poor return for the money he is spending in medical literature. He is like the Northwest farmer who has grown a great crop of grain, but is unable to harvest it and get it to the market. In the hurly and burly of practice what a wealth in literature and in unrecorded experience is lost because our literature is so diffuse and the record of our experience so neglected. How lamentable,—yes, and even tragic too when we think of the sufferings that might have been prevented or assuaged—has been the loss in literature and in experience during the past two milleniums. Since the time of Hippocrates, centuries have come and gone, leaving scarcely any trace of the culture and experience of the physicians who lived during that time. Why? Because human nature is so much the same in every age. People are too busy, too selfish, or too careless to take the time and the trouble necessary to make a proper valuation of what they have. Health must be impaired or lost; friends have to go away, or die; riches must take to themselves "wings and fly away",—all these must happen before we can form any adequate appreciation of their worth to us. In the ages that have gone a great multitude of medical men must have been so engrossed in life as they found it that they were oblivious to all that had gone on before, and apparently perfectly indifferent to what was to follow after them. So self-centered in place and era were these men that they left no trace even of themselves. What a contrast between their obscurity—the sequence of selfishness, indolence, indifference, —and the immortality of an Hippocrates, Galen, Harvey, Hunter, Lister,—the sequence of unselfishness, unwearying industry, and insatiable zeal!

Were our aged practitioners to assemble themselves in smaller or larger groups, all over the Dominion, to review medical literature, past and present, their work would be akin to that of the sturdy miners who delve into the earth and bring up treasures in gold, in silver, and in precious stones. In the libraries of our medical veterans many books are to be found which were written by men of great erudition, and of wide experience. Many of the classics in medicine were written one or more centuries ago. Out of these, our older members, in the serenity of old age, and with their hours of leisure, could bring to light many a forgotten fact. Out of their own experience also they could recall much of interest and of value to our science and art. These excerpts and reminiscences would form a strong bond of union between the past and the present. How very little our busy men know or even care about the privations and difficulties our pioneer doctors had to contend against and how praiseworthy were their achievements and their virtues.

These meetings would not only be very congenial and profitable to the fathers themselves but the fruits of their labours would be of inestimable value to their grandsons in their first decade in practice, and also to those in "the stress and strain" of mid-life. The excerpts and reminiscences would prove a wholesome anæsthetic in assuaging that noisy assurance of being "the latest thing out", so very evident in the attitude and speech of young men during their first decade in practice. Were these youths to confine the exhibition of their delusions to the inmates of lodge or club-room not much harm would be done, but when they try to obtrude it upon their seniors, or in medical societies, much valuable time and energy are sacrificed. It is true the middle-aged, and even the aged, may harbour their delusions, but wisdom and experience render these quite harmless. There are many men in mid-life so obsessed by their work as to be under the conviction that they have not time for rest, study, or the careful observation of what others are doing, or of how they are doing it. These men only enjoy an ephemeral success, for others come with better methods and the erstwhile hustlers sink into oblivion. The wise and practical men in mid-life would thoroughly appreciate the privilege of having a volume or two in which they could find, in concise form, the richest treasures in medical literature and the ripest experience of older men. The busy surgeon or consulting physician could find in these pages just what he needs.

In conclusion, the reader may say that this scheme is too visionary. Be that as it may, the facts remain that we have a great wealth in our medical literature, unused, and therefore unproductive. There is a vast amount of experience being lost because unrecorded, and we have on our list a large number of exceptionally vigorous old men, well-equipped from culture, observation, and experience, and with leisure time on their hands to do a large amount of research work, who could leave on record a wealth of practical experiences. Would not this form of research work prove both a profitable and a fascinating pastime for the leisure hours of the veterans. What memories would be awakened as they took down the old books, brushing off, perchance, the accumulated dust of decades, and re-reading the pages that would recall many faces and hallowed memories of far-distant student days. Would they not live most of their lives again as they recalled past experiences. Would not the middle-aged feel that their arduous labours were not in vain, but as the coral insects, they were helping to rear a great science, like an island, for the benefit of the race; and to the young men would not these beneficent labours of their grandfathers be an inspiration to make their young lives sublime?

"Men's thoughts and men's opinions
Are tides that ebb and flow,
On ever-shifting currents
Their minds drift to and fro."

Obituary

Dr. Percival C. Casselman, of Morrisburg, Ontario, died at the Royal Victoria Hospital, Montreal, on Thursday, September 30th. Dr. Casselman was born in Matilda Township in 1873; he graduated from McGill University in 1899. He became house surgeon at the Brockville General Hospital, and from there went to the Royal Victoria Hospital, Montreal. Later, he joined the staff of Dr. Gardner's Private Hospital, Montreal, and in 1901 went into practice at Morrisburg. Dr. Casselman leaves two children, aged five and six respectively.

Dr. Lauchlin Sinclair, of Walkerton, Ontario, died September 14th, in the seventy-seventh year of his age. Dr. Sinclair was born in Middlesex County. Before taking up the study of medicine he taught for some time; he then entered the University of Michigan where he obtained his medical degree in 1864. He joined the medical service of the United States army at the commencement of the Civil War and was present at the battles of Resaco and Nashville. When the war was over, Dr. Sinclair returned to Canada and went into practice in the village of Napier. In 1868 he went to Walkerton, where he continued to practise until the time of his death. Dr. Sinclair was surgeon to the jail for many years, and it was due largely to his continued efforts that the Bruce County Hospital was established at Walkerton. He leaves one daughter and a son, Dr. Herbert H. Sinclair.

Dr. R. J. S. Wheeler, of Birtle, Manitoba, died at the Winnipeg General Hospital on September 16th, in the fifty-third year of his age. Born at Cork, Ireland, and a graduate of Dublin University, Dr. Wheeler came to Canada about thirty years ago and settled at Arrow Smith, where he soon built up a good practice. Ten years later, he removed to Birtle. He leaves a widow, three daughters, and a son.

Dr. Joseph H. Peters, of Hamilton, died at Fergus, October 7th. Dr. Peters was a graduate of Toronto University and had been practising in Hamilton for about four years.

Dr. Kenneth Junor died at Toronto on September 26th. Dr. Junor was born at St. Mary's, Ontario, and attended the Grammar School there. After graduation, he spent some time as missionary in Formosa and, later, went into practice at Brooklyn, New York.

Dr. W. A. Cameron died from typhoid fever in the Moncton Hospital on Friday, October 1st. Dr. Cameron contracted the disease during the recent epidemic at Dorchester, Nova Scotia, where he was in practice. He was born at Advocate, Nova Scotia, and graduated from the University of Toronto last year. He was twenty-seven years of age and had been practising in Dorchester only four months.

Dr. S. B. Corbett died at Vancouver on September 9th. Dr. Corbett was born in 1846 and graduated from Victoria University in 1867. He practised in Winnpieg.

Dr. J. A. R. Leonard, of Montreal, died September 16th, in the sixty-fifth year of his age. Dr. Leonard was born at St. Vincent de Paul; he obtained his medical degree in 1876 from the Montreal Ecole de Médecine et de Chirurgie, which united with Laval University in 1891. He practiced at St. Cunegonde.

Dr. Alphonse J. P. Garneau, of Fall River, Massachusetts, died September 21st. Dr. Garneau was born at Lotbinière and graduated from Laval University, Quebec. He practised at Fall River for thirty-two years.

Dr. Henry Smith, of Norfolk, Vermont, died in September. Dr. Smith was a Canadian by birth and was born near Hamilton in 1836; he had practised in Norfolk for thirty-three years.

Dr. William F. Parmenter, dean of the faculty of medicine at the University of Buffalo, recently died at Port Stanley, Ontario. Dr. Parmenter was born at Gananoque and first went into practice near Cayuga, Ontario. He went to Buffalo in 1875.

News

MARITIME PROVINCES

A HOSPITAL is in course of construction at Newcastle, New Brunswick. The funds for the building and equipment have been subscribed and an endowment fund has been commenced. It is hoped that the building will be finished early in the spring of next year.

AN epidemic of typhoid fever is reported from Dorchester, New Brunswick. Several deaths have occurred, amongst others that of Dr. W. A. Cameron who contracted the disease in the performance of his professional duty. On October 4th, a mass meeting of the citizens was held to consider the best means of quelling the outbreak. Since the late Dr. Cameron was the only practitioner in the town, Dr. C. P. Atkinson, of Moncton, was asked to render assistance, and at the above meeting it was resolved by the citizens that he should be requested to remain until the epidemic is over. Grave dissatisfaction was expressed on account of the failure of the county board of health to deal promptly with the situation and to provide medical assistance. Dr. Gaudet, of St. Joseph's is assisting Dr. Atkinson.

ONTARIO

THE deaths in the province during the month of September numbered 390 as compared with 462 in the same month last year, and 516 in September, 1913. The cases of infectious disease reported were as follows: smallpox, 8 cases; scarlet fever, 76 cases, 2 deaths; diphtheria, 140 cases, 12 deaths; measles, 105 cases, 5 deaths; whooping cough, 114 cases, 4 deaths; typhoid fever, 148 cases, 13 deaths; tuberculosis, 101 cases, 54 deaths; infantile paralysis, 2 cases, 2 deaths; cerebrospinal meningitis, 4 cases, 3 deaths.

THE corner stone of the new hospital at Port Hope was laid on October 1st, by the Honourable Mr. Justice H. A. Ward, in the presence of a large number of citizens. The cost of the building is estimated at $24,000, of which $20,000 was bequeathed by the late Mr. John Helm. The new hospital will be completed about March and the present building will then be used as a nurses' home.

Dr. C. R. Charteris will act as medical officer of health of Chatham until Dr. Musson's return from active service.

Dr. Daniel Phelan, surgeon to the Kingston Penitentiary has retired after nineteen years of service. Dr. Phelan graduated from Queen's University in 1877.

A hospital is being built at Cochrane and will be finished about Christmas time.

Dr. D. A. Coon, medical superintendent of the Kingston General Hospital, has resigned.

The sum of $20,000 was collected for the Canadian hospitals in England and France on the occasion of the united patriotic fête which recently took place in Hamilton.

The annual meeting of the Carleton County Protestant General Hospital took place on October 14th. The year ending September 30th has been a successful one and the finance committee has been able to reduce the overdraft by more than $2,500. The number of patients admitted during the year was 2,743, including a number of soldiers, the institution having been appointed a base hospital at the beginning of the war. Several improvements and alterations were made during the period under consideration, but at the present time it is not possible to enlarge the building although additional accommodation is needed.

QUEBEC

The official opening of the new civic hospital for infectious diseases took place on the afternoon of September 30th. The ceremony was attended by a large gathering, among those present being the Lieutenant-Governor of the province, the Honourable P. E. LeBlanc, Cardinal Begin, the Mayor of Quebec, Major Pelletier, Dr. A. Simard, president of the College of Physicians and Surgeons of the province of Quebec, and Dr. Dussault, president of the Health Department, who delivered the inaugural address. The hospital will be under the supervision of the Sisters of the Grey Nunnery.

MANITOBA

Dr. B. J. McConnell has been appointed coroner for the city of Winnipeg. Dr. McConnell is a graduate of Queen's University.

ALBERTA

Several cases of typhoid recently occurred on the Duke of Sutherland estate farms, near Brooks.

The annual meeting of the College of Physicians and Surgeons, of Alberta, took place at Edmonton on Thursday, October 14th. Dr. F. W. Crang, of Edmonton South, was elected president.

Dr. W. W. Milburn, of Macleod, has been appointed physician for the Blood Reserve in succession to the late Dr. Edwards.

SASKATCHEWAN

Several cases of typhoid fever have occurred among harvesters in some of the country districts, but the number of cases throughout the province has been much less this summer than in former years.

An outbreak of typhoid fever recently occurred at Lipton, but was soon quelled by the prompt action of the public health officials. During the month of September 113 cases of the disease were reported in the province. Other cases of infectious disease reported were: diphtheria, 11; measles, 29, chickenpox, 9; whooping cough, 51; smallpox, 12; mumps, 3; scarlet fever, 1; German measles, 1; erysipelas, 4; syphilis, 2. In August, 30 cases of typhoid were reported.

The Saskatchewan military hospital is in process of organization under the direction of the Provincial Medical Council. The unit, a stationary hospital of 200 beds, with equipment, is the gift of the Medical Association of Saskatchewan. The appeal for funds has met with a generous response throughout the province and already more than half the sum required has been contributed. The provincial government has given $10,000, and the Medical Council has subscribed an equal amount. Members of the profession in Regina have contributed $1,000, the Regina branch of the Red Cross has undertaken to endow ten beds, each of which cost $50, and the city of Swift Current will provide the operating room, which will cost over $3,000. The personnel of the unit has not yet been announced.

BRITISH COLUMBIA

Dr. **William Ross Stone** has been appointed resident physician at Vanderhoof.

Dr. **R. B. White** is acting as medical health officer of Penticton, during the absence of Dr. Channing-Pearce, who is on active service.

The new hospital at Grand Forks is now completed. It was erected at a cost of $20,000.

The Vancouver branch of the Canadian Red Cross Society and the St. John Ambulance Association have been successful in collecting $33,901.42 for No. 5 General Hospital, the military hospital given by the province for service overseas. The amount subscribed is more than the sum originally required, namely $25,000, and reflects great credit upon the generosity of the people of British Columbia and those who have worked so hard to make the campaign a success. An appeal for funds was made to every city, town, and village in the province, and, on August 28th, a tag day was held in Vancouver, when the sum of $13,955.25 was contributed. The amount has been cabled to Colonel Hart, who is in command of the unit, which is now overseas.

MEDICAL COLLEGES

Dalhousie University

The Board of Governors of the University at a meeting in September appointed Dr. John Cameron of the Middlesex Hospital, London, to the Campbell Chair of Anatomy as successor to the late Dr. A. W. H. Lindsay.

Dr. Cameron had a brilliant career as a student at the University of Edinburgh where he gained several class medals including the gold medal in the class of anatomy. He graduated M.B., Ch.B. with honours, and later, on taking his M.D., received the gold medal for his thesis. Dr. Cameron is a professional anatomist; and neither a consultant nor practitioner, a highly successful teacher of anatomy and one who has devoted all his time to teaching and to embryological research.

Professor Cameron has held the following appointments; assistant to the professor of anatomy at the University of St. Andrews, senior demonstrator of anatomy, University of Manchester, and for the last six years lecturer on anatomy at the important medical school of the Middlesex Hospital, London, W. Dr. Cameron was appointed while at St. Andrews, Research Fellow of the University; and since then he has been examiner in anatomy to the University of London, examiner to the Royal College of Surgeons, London, and examiner in the University of St. Andrews.

Professor Cameron is a Fellow of the Royal Society of Edinburgh, and a member of council of the Anatomical Society of Great Britain and Ireland. He has for some years been entrusted with the responsible task of indexing the anatomical papers for the International Scientific Catalogue in process of preparation by the Royal Society of London.

As a teacher Dr. Cameron has had conspicuous success, for not only has he trained candidates for the notoriously searching examination of the Royal Colleges, but has also prepared students for the examination in anatomy and anthropology for the B.Sc. degree of the University of London. Professor Cameron has worked more particularly at problems in the development of the tissues especially the retina and sense-organs. He has written papers on the origin of the pineal body, nerve cell, the nerve fibre, and the optic nerve, and has made contributions to the anatomy of the peritoneum. In 1902, Dr. Cameron studied under the celebrated Professor His, of Leipzig.

Dr. Cameron has for many years taken an interest in university contingents of the O.T.C., and has had considerable experience in training these both in Manchester and London. The Dalhousie University is to be congratulated on obtaining Dr. Cameron's services at the present time; the appointment is a good one, for the Medical Faculty is strengthened by a professional or whole time teacher who has already acquired a position amongst British anatomists. It is probable that Professor Cameron's military training will not be overlooked in a university where so few members of the staff can claim to have had any similar experience.

Toronto University

The following candidates recently passed the supplementary examinations in the fifth year of the faculty of medicine: R. D. Cowan, P. V. Graham, J. B. Hanley, H. C. P. Hazlewood, H. G.

Joyce, W. M. Martyn, A. J. McIntosh, E. H. Stephens, and E. Z. Stirrett.

Professor Thomas G. Brodie, F.R.C.S., who went to England with the University Base Hospital, has returned. Dr. Oliver Mabee has been appointed acting Professor of Pathology until the return of Professor J. J. MacKenzie, whose leave has been extended.

Queen's University

The degree of M.D., C.M., was recently conferred upon the following successful candidates: A. B. Earl, M.B., McDonald's Corners, Ontario; J. H. Kemp, M.B., Rochester, New York; F. L. Leacock, M.B., Merrickville, Ontario; E. J. Brannan, North Bay, Ontario; N. L. Burnett, Springfield, Massachusetts; W. R. Grant, Sintaluta, Saskatchewan; A. W. Trefry, B.A., Arcadia, Nova Scotia.

Alberta University

The following candidates have been licensed by the University of Alberta to practise medicine in that province: Drs. G. H. Ingram, of Delia; W. D. Sorensen, of Edgerton; R. T. Washburn, of Weisville, and S. Astrof, of Edmonton. Supplementals in medicine and surgery were granted to Dr. R. A. Smith, of Gladsby.

McGill University

The examinations of the Medical Council of Canada were recently held in the new medical building of McGill University. Fifty-one candidates presented themselves and of these twenty-seven were successful in passing the examinations and received the qualification of L.M.C.C. They are: S. M. Asselstine, Kingston; A. R. Bayne, Sherbrooke; J. L. Clark, Edmonton, Alta.; A. H. Campbell, Spragge, Ont.; C. T. Crowdy, St. John's, Nfld.; E. B. Convery, Montreal; A. D. Campbell, Toronto; J. Carmichael, Collingwood, Ont.; K. A. Denholm, Blenheim, Ont.; W. V. Edwards, Souris, Man.; B. J. Funk, Hebert, Sask.; J. F. Gallagher, Montreal; D. Martin, Nelson, B.C.; C. R. Joyce, Granby, Que.; R. Lessard, Montreal; D. J. Mackinnon, Medford, Mass.; J. G. Munroe, Montreal; D. A. Macleod, Ottawa; C. Powles, Cape Breton, N.S.; B. C. Patterson, Hallville, Ont.; C. D. Robbins, Montreal; S. O. Rogers, Toronto; Richard Smith, Hopetown, Que.; G. E. Thomson, Kingsmill, Ont.; J. A. Urquhart, Revelstoke, B.C.; W. A. Vanderburg, Hamilton; J. G. Wright, Kingston, Ont.

The next examinations of the council will be held at Toronto and Winnipeg, coincidently, in June, 1916.

ARMY MEDICAL SERVICES

In response to a request from the War Office for more doctors, the following have been selected by Lieutenant-Colonel F. W. Marlow, A.D.M.S. for the Toronto Division, from those who have volunteered to serve with the Royal Army Medical Corps. They will leave for England at once. Lieutenants C. C. McIntyre, A. R. Riddell, S. A. Walker, S. M. Dale, P. J. Harris and G. A. McLarty, all members of the Canadian Army Medical Corps, and senior house surgeons, Toronto General Hospital. Lieutenants E. H. McVicar, A.M.C., St. Michael's Hospital. Dr. R. R. Young, Toronto Western Hospital, and Dr. C. E. Wilson, of Muskoka Hospital. Lieutenant A. B. Mofatt, acting medical officer for artillery; Lieutenant J. Cunningham, Camp Hospital staff; Lieutenant P. P. Rogers, Toronto; Dr. V. E. Cartwright, Gravenhurst Hospital; Lieutenant G. Carleton Toronto; Lieutenant F. L. Thompson, Toronto; Dr. D. A. Warren, Hamilton; Lieutenant R. Home, Toronto; Dr. T. R. Phipps, Toronto; Lieutenant A. M. Murray, Toronto; Dr. W. A. McLeod, Elmsdale; Drs. H. C. Sutton, Port Credit; J. W. Wheeler, Cornwall; A. W. Nixon, Georgetown; A. G. Wallace, Thessalon; E. Bryceson, Toronto; J. J. Hurley, Toronto; W. S. Grimshaw, Toronto; H. C. Moyle, Burlington; W. B. Seaton, Clifford and Toronto; M. D. Kyle, Fergus; W. E. Dean, Toronto; N. N. Ferguson, Toronto; W. W. Conise, Toronto; G. Cooper, Charlton; Captain M. H. Embury, Allandale; Lieutenants, D. M. Kilgour, Toronto; A. M. Robb, Toronto; F. A. Ross, Barrie.

Other physicians who have joined the Royal Army Medical Corps are: Dr. A. Ross, of Charlottetown, Prince Edward Island; Dr. B. Francis, of Sydney Mines, Nova Scotia; Dr. Frederick B. Day, of Thorburn, Nova Scotia; Dr. McKenzie, son of Dr. A. F. McKenzie, of Monkton, Ontario; Dr. W. J. Brown, of Lindsay, Ontario; Dr. Edgar Bissell, of Mallorytown, Ontario; Dr. C. R. Totten, of Windsor, Ontario; Dr. A. B. Roberts, of Saskatoon; Dr. H. B. Stacpole, of Cardston, Alberta; Dr. Howe A. Jones, of Moncton, New Brunswick; Dr. H. C. Murray, of Owen Sound, Ontario; and Major F. J. R. Forster, of Stratford, Ontario.

Dr. O. A. Cannon, of Stratford, Ontario, is in charge No. 3 Stationary Hospital, which is stationed on the Island of Lemnos, in the Aegean Sea, together with No. 1 Stationary Hospital. No. 5 (Queen's) is at Cairo. Lieutenant-Colonel Hanford McKee, who was in command of No. 3, has been seriously ill and has been invalided to England.

Major F. Guest, of St. Thomas, Ontario, is on the staff of a hospital at West Mudros, Lemnos Island, which is about forty miles from the Gallipoli Peninsula.

Major H. H. Burnham, of Toronto, who is on the medical staff of the 2nd Brigade, C.F.A., has been mentioned for distinguished conduct.

Captain Harry Morrell, of Regina, is bacteriologist at the Duchess of Connaught Hospital, Cliveden.

Major R. Percy Wright, of Montreal, has been appointed Officer in Command of No. 1 Field Ambulance, in succession to Lieutenant-Colonel A. E. Ross, who is now assistant director of medical services of the first Canadian division.

Dr. Dakin, formerly superintendent of the Regina General Hospital, has been appointed to a hospital position at Cairo.

Dr. John R. Whitman, of Brantford, Ontario, accompanied the third universities' overseas battalion, who left some weeks ago to reinforce the Princess Patricia's Canadian Light Infantry.

Lieutenant-Colonel E. C. Ashton, M.D., of Brantford, Ontario, has been made Brigadier-General.

Dr. J. Moore, of Palmerston, Ontario, is on active service.

Lieutenant Young, of Guelph, Ontario, has joined the Army Medical Corps. Dr. Young was on the staff of the Western Hospital, Toronto. Dr. E. Bryceson, of Toronto, has also joined the Army Medical Corps.

The following have been appointed medical officers of overseas battalions: Dr. Bailey, of Moose Jaw, of the 46th Battalion which is in training at Camp Hughes, Saskatchewan; Dr. E. E. Meek, of Regina, of the 28th Battalion, now at Sewell Camp, Manitoba; Dr. H. W. Paddell, of Swift Current, Saskatchewan, of the 10th Mounted Rifles; Lieutenant-Colonel Hayes, of the 85th Nova Scotia Highland Regiment, Lieutenant H. C. Davis, of Port Coquitlam, British Columbia, assistant medical officer of the 11th Mounted Rifles.

Captains Jupp and D. J. McKay, A.M.C., of Woodstock, Ontario, have left for active service overseas.

Lieutenants T. H. Lunney, R.A.M.C., of St. John, and O'Donnell, R.A.M.C., of Debec, New Brunswick, have left Aldershot for the British base hospital at Malta. Lieutenants McIntosh, R.A.M.C., of Hartland, and Lawson, R.A.M.C., of St. Stephen, New Brunswick, have joined the staff of a clearing hospital in France.

Dr. W. A. Henderson, R.A.M.C., of Sarnia, Ontario, has been appointed physician-in-chief of a hospital ship plying between England and the Dardanelles. The ship contains four hundred and fifty beds and has a personnel of six physicians, twelve nurses, and forty-eight orderlies.

Dr. William Norman Gilmour, of Brockville, Ontario, has joined the Royal Army Medical Corps. Dr. Gilmour, who was in Australia at the time, went to South Africa when the war broke out and joined the forces under General Botha. He afterwards left South Africa and went to England.

The distinguished conduct medal was recently bestowed upon Private H. T. Cameron, of No. 3 Field Ambulance, First Canadian Division.

Dr. J. B. Woodrow, of Edmonton, is serving with the Royal Army Medical Corps in France.

Major C. A. Peters, of Montreal, has been given the temporary rank of colonel.

Dr. Charles G. Bell, of Chatham, Ontario, who joined the 34th Battalion as a private, has been transferred to the Army Medical Corps.

The Salvation Army was recently granted permission to provide a unit of Canadian-built ambulance cars for service at the front. Every corps and institution contributed something to the funds required, and the unit was dedicated by the Lieutenant-Governor of Ontario, Sir J. S. Hendrie, K.C.M.G., on the occasion of the annual congress which was held in Toronto last month. The ambulances will be manned by Salvation Army officers. Similar units have been given by the British Salvation Army for service in France, and by the Australian for service at the Dardanelles.

Dr. H. H. Planche, A.M.C., of Cookshire, Quebec, is on active service at the Dardanelles.

The Dalhousie Military Hospital is in process of organization. It will have a staff of at least twelve surgeons and physicians, with the corresponding number of nurses, orderlies, and stretcher-bearers. Among those who probably will accompany the unit are Drs. John Stewart, E. V. Hogan, L. M. Murray, Victor Mackay, J. G. MacDougall, Kenneth MacKenzie, S. J. MacLennan, F. W. Woodbury, and John Rankine.

Dr. F. H. Mewburn, of Calgary, is on the staff of the Duchess of Connaught Hospital at Taplow, Buckinghamshire, England. The hospital is supported by the Red Cross, and contains one thousand beds.

Dr. Oswald Withrow, of Toronto, has enlisted as a private in the 81st Battalion.

Dr. Ella Scarlett-Synge, of Vancouver, has been appointed medical officer for Batochina and the surrounding district, which lies half way between Nish and Belgrade. There is a great shortage of drugs in Serbia and Dr. Synge asks that contributions of drugs be sent to Mrs. Watson, Serbian Relief Committee, 5 Cromwell Road, London, England.

His Royal Highness the Duke of Connaught inspected No. 6 Stationary Hospital at Montreal on Thursday, October 14th.

The unit has been supplied by Laval University, and is under the command of Lieutenant-Colonel G. Beauchamp.

Captain Howard Hepburn is serving on the staff of one of the British field hospitals. Captain Hepburn at one time was the medical superintendent of the Montreal General Hospital; he left Montreal to take the position of medical adviser to the King of Siam.

Dr. Harold Tait, R.A.M.C., of St. John's, Newfoundland, is on the staff of a base hospital of three thousand beds at Malta.

CASUALTIES

Seriously Ill

Lieutenant-Colonel H. R. Casgrain, of Windsor, Ontario, Officer in Command of No. 3 Stationary Hospital, C.E.F., in hospital at Alexandria; later invalided to England.

Major Hanford McKee, of Montreal, Officer in Command of No. 1 Stationary Hospital, invalided to England from the Dardanelles.

Wounded, September 29th

Captain William J. Enright, of Port Daniel East, Quebec (22nd Battalion, French-Canadian).

Lost on Transport

Dr. Lorne Graham, of Wallacetown, Ontario, lost his life in the Aegean Sea on August 17th, when the transport on which he was serving was torpedoed.

Died

Matron Jaggard, of Wolfville, Nova Scotia, died September 25th (No. 3 Stationary Hospital).

Nursing Sister Mary Frances Munro, of Wardsville, Ontario, died of dysentery, September 7th (No. 3 Stationary Hospital).

CORRESPONDENCE FROM THE SEAT OF WAR

To the Editor,

Canadian Medical Association Journal:

Sir,—Towards the end of May work became very slack at La Panne and, as I wrote before, at this juncture some American Red Cross surgeons arrived and numerous Belgian doctors came also to Dr. Depage's Hospital. There was an increasing demand for medical men in England, so I determined to return here, though one realized what exceptional opportunities La Panne offers, and I was very sorry to leave Belgium after five such stirring months.

The Belgian and French soldiers were very appreciative of what the British did for them and wept on saying good-bye. They were keen, so many of them, to give "souvenirs," bits of shell, cartridges, etc., and we did not often refuse these presents. But this collecting of war mementos is a dreadful habit! One volunteer, a lawyer by profession, promised me a German officer's sword and took my Canadian address in order that he might send it to me "après la guerre." He says the weapon is quite safe as it is in a cellar, under a cellar, in Louvain!

I left La Panne only a few days before the Canadian nurses arrived, but have heard since that their sound training has been recognized by the Belgians, and that they have been very well liked.

The trip down by motor to Calais was not without interest, though one had made it several times before. Just outside the ramparts of Dunkerque, close to the canal which runs from Furnes, we could see where the first big German shell had fallen after its flight from a spot close to Dixmude, a distance of about twenty-four miles. The result of this shot was telegraphed back by wireless from a German aeroplane watching overhead and the next ones, after the range had been lengthened, destroyed many houses and killed many people near the railway station. One exploding shell lifted the steel rails high into the air and these came to rest on the roof of a nearby building. It seems almost incredible that these shells should weigh more than a thousand pounds. Dunkerque seemed a much quieter place than it was in November and December, 1914. Many of the inhabitants had left, the streets were almost empty, and the shutters were up on so many of the shops, though it was a week-day afternoon. It is small wonder that some of the French people think that England has not yet realized what the war means. We went through the town of Dunkerque, out the other gate, and soon left the country of the sand dunes behind. We passed some large British motor transport-waggons on the hot, dusty road and saw "Tommies" sleeping on top of their load—others cheered to us. As somebody had remarked to me on another visit, "Calais does not seem a very interesting place to me, but there are a lot of people trying to get here." No doubt the Germans would at least make it interesting if they could! At Calais we had to visit the British Consul and the Naval Transport Officer, and spent the night. It is becoming increasingly more difficult to cross the channel by the Calais-Folkestone route. There were the usual number of British army officers coming home on leave and several members of the Friends' Ambulance Corps on board with whom I had worked last autumn. The sea was calm and the day bright and clear. The idea of hostile submarines scarcely entered our minds. We wondered if it was true that the Admiralty had submerged great wire nets for the protection of the passage.

Many Canadian troops were then, and are still, camped about Folkestone and on the way to London I saw some of the staff of No. 3 General Hospital (McGill), and at West Sandling No. 6 Canadian Field Ambulance with Col. R. P. Campbell in command. Everybody looked brown and extremely well and all were keen to get to the front. In Folkestone, too, I met some Queen's men who were there with the Stationary Hospital.

It had been my intention to join the R.A.M.C. in England, but in London I was asked to take charge of a country house, which was being offered to the War Office as a hospital for semi-convalescent officers, and for a month or so, whilst matters were in the hands of the War Office, I worked at a hospital for officers in Park Lane. People in England have been wonderfully good and very many private houses have been converted into hospitals, the families often having little or no room left to themselves. One of the best examples of this generosity is at Milton Hill near Oxford. Before the end of August, 1914, the house, with the riding school, was made ready to accommodate 160 patients; linoleum was put down on all the floors, the fine carved panels and book cases were boarded in, more baths were provided and sterilizers and an x-ray apparatus were put in. The "Tommies" are very happy, and when able to be up, may roam about the park and play cricket, croquet, bowls and other games. A Scotch surgeon and his assistant are in residence there, and the government is relieved of a large expense, as the owner of the house and his brother pay for everything. I saw several Canadians there.

At London we had seventeen or eighteen beds and practically all the rooms on the ground floor were given up for wards and upstairs, too, there was a room for operations. The cases, on the whole, were not very serious, but we had one cheerful Irishman with compound and suppurating fracture of the upper third of the femur. A Scotchman was there who had been wounded by a rifle bullet, which had entered the left side of the thorax, narrowly missed the vetebral column, smashed the tenth rib on the right side not far from its angle, and the wound of exit was below the angle of the right scapula. The entrance wound healed readily, but there was a troublesome sinus leading from the exit wound. Three weeks after being wounded the left chest had to be drained of a large quantity of purulent fluid, by resecting a portion of the ninth rib. Evidently there had been a large effusion of blood into the chest, which later became infected and slides showed streptococci. It was fortunate that an operation was not necessary till quite late, as adhesions had evidently formed and the trouble was not allowed to extend to the right chest. His recovery has been uneventful.

It has been very interesting to compare the patients seen in England with those at La Panne. It may be taken as an axiom perhaps, that those who are more highly educated and those who hold positions of responsibility, must of necessity feel the "stress and strain" of this war more than the ordinary soldier. At La Panne the vast majority of patients were men or non-commissioned officers. It may have happened that they were very highly-strung by nature and could not be taken as fair examples of the British officer—but so many at Park Lane showed the "nervous" effects of the constant excitement of the life, and the din of the guns in Flanders to a remarkable degree. The French officer is much more excitable in battle, but it would seem as if this giving way to feelings acts as a kind of safety-valve, and that the calm and self restraint of the Britisher under fire is not proof that the after-effects are not greater and more serious in his case. Some of the officers in London were so "hipped" and had lost almost all self-control, that we had our hands full to cheer them up. One patient especially was extremely melancholy. There is a Special Officers' Hospital in London, now, for the treatment of cases of nerve shock. Many of these cases of course have not been wounded.

It was our policy at La Panne to clean up all wounds immediately, and to remove every piece of metal whenever possible—though this procedure appears not to have been necessary in other wars One is struck with the number of slowly healing sinuses in England, and in numerous cases one has to go in later and remove a fragment of shell or a bit of clothing, or on the other hand, if the foreign-body is left buried, healing and convalescence are so much the slower and officers are so much longer unfit for duty. However, we had one case in London where it would have been dangerous and folly to have tried to extract the piece of shell. It had entered the back over the spine of the left scapula, had fractured this, and had passed up beneath the deep muscles of the back of the neck and lay close to the vertebral column. This officer was wounded on May 16th, and ten days later, owing to rise in temperature and marked suppuration, the entrance wound had to be opened up widely, pus evacuated and a drainage tube inserted, but the metal could not be easily reached and was left in. There was still a small amount of discharge on the dressing and small spicules of bone came away till after July 15th—movement of the arms was remarkably good, however. In other cases, notably a persisting sinus in a thigh and a sinus in a forearm which lasted for over three months—the *x*-ray showed metal and necrosed bits of bone—more radical treatment at first instead of later would have much shortened the time of recovery.

One afternoon in London, after only a few hours notice, the King and Queen came to visit the hospital. They were both very interested in the patients and talked for a few minutes with each in turn. It seemed strange that the King should relate a "story" that he had heard about some German officers, and at the same time he said he did not know if it were true or not. And it was a rumour that we had all been discussing the previous day! The Queen especially asked questions of the doctors and nurses about hospital details, and examined minutely the material of which the ward screens were made.

London streets are full of wounded officers and men, and one meets numerous Canadians, and curiously enough I ran across a Canadian whose chest I had measured in Montreal in August, 1914. It seems the fashion to make a head dressing do instead of a service cap. They are all well entertained and many people spend every afternoon singing, dancing, or reciting for the wounded, and often theatre tickets are sent to the different hospitals and all who can, in uniform, mufti or in the blue hospital suits, go and enjoy themselves. We sent one officer off to his brother's church wedding in such a light blue hospital costume!

England is always the home of organizations and committees, and now there is one which provides carriages and motors for the wounded, another looks after the correspondence about officers' lost equipment, and so on. The scheme of the Canadian Red Cross for visitors to the wounded Canadians is a splendid one; lists of the Canadians are sent to prominent Canadian women or to women especially interested in Canadians and they visit and write a weekly report on the condition of the wounded in their district. Now, too, the Atlantic Union have provided funds to take Colonial soldiers in any British hospital out for drives. The names of the schemes to aid the wounded are legion and during the week August 16th to 23rd, "The National Egg Collection for the Wounded" attempted, and I think succeeded, in gathering together a million eggs, and illuminated posters were put up in all the villages of England.

The quietest places in London are disturbed by the war, and at the Royal College of Surgeons' Museum, Professor Arthur Keith showed me how some of the most valuable specimens were being removed to a place of comparative safety in the cellar against the arrival of the Zeppelins. It was feared that the Germans might drop incendiary and asphyxiating bombs and some householders always keep a supply of water and sand in readiness, and the number of respirators sold to London's citizens since the month of May must run into the hundreds of thousands. It was rather ludicrous to see a stout lady walking on the street in broad day light with one dangling from her parasol! However, things in London lately were no laughing matter.

The surgeons and physicians are naturally extremely busy with war work in England and those, who are members of the Territorial Force and who attend to their private work as well, deserve the highest praise. Many of them have been working at highest pressure since the beginning of the war—having to visit various military hospitals. The Harley Street man is often clad in khaki instead of the "customary suit of solemn black"—and so many have scarcely had a holiday in the last twelve or fourteen months.

We began work here about July 1st, in a large old country house in the county of Rutland—once the seat of the Earls of Nottingham and Winchilsea. There is accommodation for about twenty patients. This hospital is affiliated to the London District and exists in order to relieve the congestion of the hospitals there in times of heavy casualties. A colonel of the R.A.M.C. in London has charge of all London officers' hospitals, and, of course, we were inspected by him before we opened. So far all our beds have never been filled and all over the country there has been less work than in the spring.

London is not always a very suitable place for officers getting well; there is too much excitement, and the authorities in London seem glad to send some of the cases here.

Rutland is a beautiful hunting country, and this year is rather empty, but the people who are here, are very kind and the officers are taken out for a drive and invited out for tea nearly every day. On Saturday we in our turn have visitors—but in the country the over anxious relative of the patient is almost unknown!

Practically all the officers have come from Flanders, but two were wounded on the Gallipoli Peninsula, or "on the Peninsula", as they call it. One patient was wounded in East Africa. With their first hand information one can realize the task which has been before the Allies at the Dardanelles. Nowhere can the soldiers find a place of safety from shells—even when resting down on the "beaches" they are exposed to the fire of the enemy. The modern sniper abounds upon the "heights" and often lies hidden in the heather behind the British trenches. There are an extraordinary number of German officers with the Turks, and, I believe, a non-commissioned officer with every machine gun. The Turk is a splendid fighter, they say, and we are glad to hear how well they often treat our wounded. Would that the Germans might take this kindliness on the part of their ally to heart. The losses there have been terrific, as we all know, and the more lamentable when we realize that early in this year Achi Baba, and the other strong places were quite unfortified and the British middy was free to wander at will over the hills when off his ship. Naturally the Royal Army Medical Corps has to face a tremendous task as very little can be done for the wounded on land, and they must be almost immediately put on hospital ships and conveyed to Alexandria, to Malta, or sent direct to England. At Malta there are something like thirteen thousand beds.

Only five or six of the patients that we have had were in the regular army before the war, but were lawyers, in business, undergraduates, or volunteered on leaving school. One officer over forty years of age had seen twenty-four years of service, and was sergeant-major in a cavalry regiment up to a short time ago, when he received his commission as second lieutenant. It is splendid that these men should receive their reward and I suppose as never before a man may work up from the ranks.

Some of the surgical cases we have had have been very interesting, and this chiefly because of injuries to nerves. One man in the Gordons was wounded by shrapnel more or less all over his body. Several tiny fragments struck him just in front of the left ear injuring branches of the facial nerve. The left side of his face was not as full as the right, and the wrinkles were almost gone, there was a marked hollow beneath the left eye and, especially when out in a wind, tears ran over this cheek. He could not raise his left eyebrow, frown or properly close the eye. His smile was a curious one-sided affair and the teeth were not as well shown on the left as on the right side of his mouth. So characteristic was the picture of peripheral facial paralysis that probably his photograph will appear in a book (in the series of "Oxford War Primer of Medicine and Surgery") on "Injuries to Nerves," which is being written by Dr. Purves Stewart and Mr. Arthur Evans. Movement in the facial muscles was gradually returning when he left us.

It is curious how sometimes in a lesion of a nerve certain branches are picked out. In one case a rifle bullet had passed through the lower third of the right arm from the front and had fractured the humerus. The officer had wrist-drop, and we kept him on a splint with the hand markedly flexed dorsally in order that the strain might be taken off the extensor muscles. There were only two patches of anæsthesia, one about six or seven inches long and about three inches broad, which was situated on the external aspect of the elbow joint. It was very irregular in outline, and extended farther below than above the articulation, the other lay on the dorsum of the hand, and measured two by two and a half inches and was situated above the root of the first finger, and the cleft between the thumb and first finger. The lower border of the area of anæsthesia was just below the metacarpal-phalangeal joint of the first finger and a prolongation extended down the middle of the dorsal surface of the thumb as far as the nail. The palmar branch of the radial was not disturbed though later at the operation in London the surgeon found the musculo-spiral involved in scar tissue and thought that the bullet had severed the nerve, but could not be absolutely sure as all the tissues were so bound together. The nerve was isolated and a gap between the ends was bridged by turning down a portion from the proximal part and sutured to the peripheral. It is too early to foretell the final result.

I have seen Von Volkmann's contracture of the flexor tendons of the fingers for the first time here. This followed on a shrapnel wound and compound fracture of the middle third of the ulna. A portion of the ulnar nerve was also injured and there was a patch of anæsthesia as a narrow strip below the wrist on the ulnar border of the hand, and little finger and extending for a short distance on to the palmar and dorsal aspects.

The two Dardanelles' cases spoken of above were both gunshot wounds of the head. One was of particular interest.

On June 6th, Capt. R. A. G. C., after being only five days on the Peninsula, was struck by a shrapnel bullet. This entered the skull just above and behind the left ear. On June 7th, he was taken on board a hospital ship at Lemnos and was conscious on admission. On this same day he had an epileptic seizure, which became general. The head was trephined and four fragments of the depressed bone were removed from the brain tissue. No attempt was made to remove the bullet. Lumbar puncture showed turbid fluid and there was rigidity of neck and Kernig's sign was present. Up till June 14th, when he reached Malta, he had several Jacksonian attacks daily. It was noted at Malta that the seizures began in the right facial muscles and spread to right arm, right leg, and then became general; patient lost consciousness, was very cyanosed and frothed at the mouth. There was some retraction of the head and temperature was 100°, and pulse 100. Marked Kernig and Babinsky. The wound was more widely opened up, but lumbar puncture showed clear fluid and no growth was obtained. The temperature dropped and the last epileptic attack was on June 16th. He now became much clearer mentally, but it was noted in his report that he had word deafness, could speak, but on making use of a wrong word or on mispronouncing one, he did not notice his mistake. The operation wound was healed by June 26th. On July 8th, he could write much better, but had difficulty in spelling. Could read to himself, but not aloud. The bullet was located by *x*-ray on July 15th, and lay at the level of the external occipital protuberance, a little to the left of the middle line. His vocabulary at this time was increasing but there was some loss of memory. The patient left for Gibraltar on August 2nd, and after spending about two weeks there, came to England. After a week in London he was sent to us here as he was in a very excitable condition. When the officer reached here on August 30th there was a circular depression about two and a half inches in diameter at the site of operation, the floor of which pulsated. He still had difficulty in finding certain words and in reading aloud, occasionally mispronounced long words such as "mathematical." Memory was good for recent events and those which occurred some years since.

Nothing was found wrong with any of the cranial nerves except the second, which will be discussed later. In the limbs and trunk the motor and sensory systems showed no change from the normal, and there were no abnormal reflexes. His gait was steady and he could stand steady with feet together and eyes closed. On questioning him about his eyesight, he complained that in holding a book in the ordinary way he was unable to see the last few words at the end of the lines, but had to rotate his head slightly to the right in order to read these words. First, with the rough test with the finger tip, and then by mapping out the visual fields of both eyes on a black cloth, I found a marked grade of homonymous hemianopia—or restriction of the upper nasal quadrant of the visual field of the left eye and of the upper temporal quadrant of the right one. It will be interesting to note if any improvement occurs as the other day he walked into the corner of a white wall, which was to his right hand. The pupils reacted to light thrown on to the retinæ from all angles and this fact would lead one to diagnose a lesion behind the optic tract and basal ganglia in the course of the fibres as they run into the caveate lobe.

We have had five cases of "nerve shock" with more or less serious symptoms. In only one case was there an actual wound. The majority complained that they were "blown up" by a shell or that a shell burst very close to them. The commonest symptom complained of was headache from which three suffered. Two claim that they were unconscious for a time when first "concussed." Two complained of muscular weakness and exhaustion and of indefinite pains in the limbs. One suffered from giddiness and one showed marked change in his speech and could scarcely walk. The previous histories of most of these cases is interesting and points to an "unstable nervous system", if one may be allowed to use such a phrase. In one instance it was the second time that the officer had returned from Flanders with "nerve shock."

One case, that of a lieutenant, is perhaps worth recording. Several times before the war began he had suffered from, as he describes it, "brain fag," and there was some illness commencing about 1909, when he was laid up in France under the care of a physician and nurse for two and a half years. It would appear that there was something about this sickness which he seeks to hide and very little more can be learned from the patient than that he was greatly "collapsed," and "run down." On May 9th, he states that he was "blown up by a shell", and according to his version of the story was unconscious for four days, and after recovery of his senses he had difficulty in seeing objects and often they appeared double. He suffered from severe headache. He thought his spine was injured and was unable in the London hospital, and still is unable, to walk except with head and body bowed forward, his knees bent and has difficulty in lifting up his feet to mount a step. Progression is very slow and only possible with the aid of two canes. He arrived here on July 25th, and showed a peculiar hesitancy and sometimes stuttering of speech and these defects were markedly accentuated when he became excited or in talking to a stranger. He is a very highly-strung individual and quickly flies into violent fits of anger, has a very active vaso-motor system, and very quickly flashes up. The pupils react to both light and accommodation and the cranial nerves show no abnormality except that he has an almost insensitive soft palate and pharynx. Though he says he cannot hold himself erect when standing, he immediately straightens out somewhat on putting him to bed. The upper limbs show nothing abnormal, and in the trunk, except that sensation is very much dulled over the back, especially over the lumbar muscles close to the spine, there is nothing worthy of note. The lower limbs are kept slightly flexed at the knees. There is some rigidity, but on asking him to relax the muscles the limbs are freely movable at all the joints. However, the patient cannot by himself extend the legs if the knee is flexed for him nor bend up the knees if the lower limbs are straightened out by the examiner. It would be impossible for him to do these things as he always contracts the antagonistic muscles in his efforts at flexion and extension During these attempts he breathes hard and grasping the sides of the bed tightens up his arms. The knee jerks are generally slightly increased, but vary from day to day. There is no patellar or ankle clonus and the Babinsky phenomenon is absent. There is dulness of sensation to pin prick in the legs, but no "stocking anæsthesia." He has had daily massage, but has not improved greatly. He is a difficult case on account of his fits of temper and the nurses have done well to manage him at all. It is a hard matter to make him eat, especially if he has been "crossed" in any way. One evening he had an hysterical attack which began slowly with deep inspiratory efforts, later there were irregular movements of the arms and he would hold his breath as long as possible, and at times he grasped the top of the bed. The pupils were equal and somewhat dilated and reacted to light. There was no mictuition. The attack lasted for about half an hour and we left him with the light turned down. He says he remembers everything that happened and the next morning was very keen to know "if the doctor was alarmed." Fortunately he has had no more of these attacks. For his back we are going to try a supporting jacket—as Sir William Osler suggested —with the suggestion that it will "strengthen the muscles." The outlook, one must confess, does not appear to be particularly bright and if we could get something definite about his previous long illness an accurate prognosis might be made.

This hospital will not be kept open after the cold weather begins. as most of the patients have not been very ill and it would be a very difficult matter to keep the officers occupied or amused. However, after a period close to the firing line these last three months or so have been good experience, and have served to show another side of the picture.

T. A. MALLOCH.

BURLEY-ON-THE-HILL, RUTLAND, September 25th, 1915.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Journal of Medicine and Surgery, September, 1915:

The treatment of eclampsia . . .	G. C. Copeland.

The Canadian Journal of Medicine and Surgery, October, 1915:

Hæmorrhage into the lateral ventricle: recovery	G. E. Jurben Lannin.
Disabilities, including injuries caused by bullets, shrapnel, high explosives, etc., as illustrated by cases examined before a medical board at Canadian Headquarters, Shorncliffe, England . .	A. Primrose.

Dominion Medical Monthly, September, 1915:

Cancer of the uterus with special reference to diagnosis	G. Stewart Cameron.
Some observations on blood pressure .	A. T. Emmerson.

The Canadian Journal of Medicine and Surgery, September, 1915:

The treatment of eclampsia . . . G. G. Copeland.

L'Union Médicale du Canada, August, 1915:

Pasteur. Sa vie, son oeuvre, 1822-1893 . A. LeSage.

Le Bulletin Médical de Québec, September, 1915:

Le developpement de l'enfant . . . A. Jobin.
Pellagre . . . . L. G. Pinault.
Pneumothorax artificiel. (Statistique) . E. Grenier.

Le Journal de Médecine et de Chirurgie, August, 1915:

Le traitement de la tuberculose pulmonaire par la méthode de Forlanini . E. Grenier.

Dominion Medical Monthly, October, 1915:

The treatment of eclampsia . . . G. C. Copeland.

The Canada Lancet, September, 1915:

Treatment of the fever heart . . . H. B. Anderson.
The method of dealing with tuberculosis in the public schools of Toronto . . A. McKay.
How shall we enforce a better observance of quarantine? . . . . . C. F. Laurie.

Medical Societies

TORONTO ACADEMY OF MEDICINE

An interesting address was given before the Academy of Medicine by Dr. W. P. Manton, of Detroit, on Tuesday, October 5th, "Marriage rites and obstetrical practices amongst the ancient Romans." On this occasion two volumes of Ancient Works in Medicine were presented to the Academy by Sir William Osler, through Dr. J. H. Elliott. Dr. C. J. Algernon Temple, a former professor of gynæcology in the University of Toronto, was elected an honorary Fellow of the Academy. Dr. W. H. B. Aikens, presided.

ONTARIO MEDICAL ASSOCIATION

It seems fitting that the Ontario Medical Association should make plans early for the annual convention, to be held in Toronto, in May, 1916. Work is now being done, not only to insure success at the next meeting, but also to coöperate with the profession throughout the province in the organization of county medical societies along the lines approved of by the Peterborough meeting. The latter is a big task but seems well worth while and should commend itself to the profession.

In carrying out this campaign the Ontario Medical Association will be living up to the best traditions of its founders, and in this connexion a quotation from one of the Canadian medical journals of 1882 may not be out of place—"The Ontario Medical Association should promote sentiments of mutual respect and fraternity, the plentiful lack of which there is still great reason to deplore." It is the intention of the present executive to do what they can to remedy the faults existant in 1882 which still survive in an attenuated form in 1915.

It is interesting here to note that the association has been in existence since 1880 and has held meetings since 1881. Dr. Adam Wright and Dr. J. E. Graham first conceived the idea of a provincial organization. At a preliminary meeting held to consider the matter of organization were Drs. Workman, Coventor, Graham, and J. H. Burns, Adam Bright and J. E. White. The first president was Dr. Workman. For thirty-five years the association has prospered. There seems to be no doubt that the executive, with the coöperation of the members, will not allow the organization to languish even though under the stress of war conditions.

PERTH COUNTY MEDICAL ASSOCIATION

The quarterly meeting of the Perth County Association was held in the Town Hall at St. Mary's, Ontario, on Wednesday, October 13th. The attendance was good. The chair was taken by Dr. C. F. Smith, of St. Mary's, and papers were read by Dr. Hadley Williams, of London, on "The diagnosis of serious abdominal diseases," and Dr. W. F. Brown, of St. Mary's, on "Three obscure cases of disease of the nerves." It was decided to present Dr. McKenzie, son of Dr. A. F. McKenzie, of Monkton, with a gold wrist watch on the occasion of his leaving for service with the Royal Army Medical Corps.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. Murray MacLaren, St. John, N.B. President-elect—Dr. R. E. McKechnie, Vancouver. Secretary-treasurer—Dr. W. W. Francis, 836 University Street, Montreal.

Annual Meeting, Vancouver, B.C., 1915, postponed.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. W. H. B. Aikins, 134 Bloor Street West. Secretary—Dr. J. H. Elliot, 11 Spadina Road.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. T. H. Whitelaw, Edmonton. Secretary—Dr. F. C. Clarke, Calgary.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. W. A. Lincoln, Secretary—Dr. H. A. Gibson. Treasurer—Dr. H. H. Johnson.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Dr. J. G. Adami, Montreal. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. N. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. C. J. Hastings, Toronto. Secretary—Dr. O. Withrow, Lumsden Building, Toronto.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier, Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. D. A. Cameron, Dutton, Ont. Secretary-treasurer—Dr. A. B. Riddell, Bayham, Ont.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALIFAX MEDICAL ASSOCIATION:—President—Dr. K. A. McKenzie. Secretary—Dr. F. V. Wood.

HAMILTON MEDICAL ASSOCIATION:—President—Dr. John Y. Parry. Corresponding Secretary—Dr. P. D. MacFarlane. Recording Secretary—Dr. O. W. Niemier.

HURON MEDICAL ASSOCIATION:—President—Dr. Kennedy. Secretary-treasurer—Dr. Redmond.

KINGSTON MEDICAL AND SURGICAL SOCIETY:—President—Dr. W. G. Anglin. Secretary—Dr. W. T. Connell. Treasurer—Dr. G. W. Mylks.

LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. R. M. Calder, Petrolea. Secretary-treasurer—Dr. J. E. Kidd, Wyoming.

LONDON MEDICAL ASSOCIATION:—President—Dr. C. H. Reason, 538 Dundas Street. Secretary-treasurer—Dr. L. S. Holmes, 260 Hamilton Road.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION:—President—Dr. J. S. Poole, Neepawa. Secretary—Dr. Ross Mitchell, Winnipeg. Treasurer—Dr. Glen Hamilton, Winnipeg.

Medical Societies—*Continued*

MEDICAL OFFICERS OF HEALTH FOR COUNTIES OF LINCOLN AND WELLAND:—President—Dr. King, St. Catharines. Secretary-treasurer—Dr. Howell, Welland.

MEDICINE HAT MEDICAL SOCIETY:—President—Dr. W. M. Thomas. Vice-President—Dr. W. H. MacDonald. Secretary-treasurer—Dr. A. V. Brown.

MONTREAL MEDICO-CHIRURGICAL SOCIETY:—President—Dr. D. F. Gurd. Secretary—Dr. Hanford McKee.

MOOSE JAW MEDICAL SOCIETY:—President—Dr. J. M. Hourigan. Secretary-treasurer—Dr. J. Bloomer.

NEW BRUNSWICK MEDICAL SOCIETY:—President—Dr. W. W. White, St. John. Secretary—Dr. J. D. Lawson, St. Stephen. Treasurer—Dr. W. E. Gray, Milltown.

NIAGARA DISTRICT MEDICAL ASSOCIATION:—President—Dr. E. T. Kellam Niagara Falls. Secretary—Dr. G. M. Davis, Welland.

NOVA SCOTIA MEDICAL SOCIETY:—President—Dr. C. J. Miller, New Glasgow. Secretary—Dr. J. R. Corston, Halifax.

ONTARIO MEDICAL ASSOCIATION:—President—Dr. H. B. Anderson, 184 Bloor Street East, Toronto. Secretary—Dr. F. A. Clarkson, 421 Bloor Street West, Toronto. Assistant Secretary—Dr. F. C. Harrison, 29 Roxborough Street West, Toronto.

OTTAWA MEDICO-CHIRURGICAL SOCIETY:—President—Dr. J. F. Argue. Secretary—Dr. R. K. Paterson. Treasurer—Dr. A. S. McElroy.

OTTAWA MEDICAL SOCIETY:—President—Dr. Charles W. Gorrell. Secretary—Dr. A. MacLaren. Treasurer—Dr. Harold Alford.

PERTH MEDICAL ASSOCIATION:—President—Dr. A. F. McKenzie, Monkton. Secretary-treasurer—Dr. F. J. R. Forster. Stratford.

PERTH COUNTY MEDICAL ASSOCIATION:—President—Dr. C. F. Smith, St. Mary's. Secretary-treasurer—Dr. F. J. R. Forster, Stratford.

PETERBORO MEDICAL ASSOCIATION:—President—Dr. J. V. Gallivan. Secretary—Dr. D. C. King. Treasurer—Dr. N. D. Buchanan.

PICTOU COUNTY MEDICAL ASSOCIATION:—President—Dr. C. S. Elliott, Stellarton. Secretary—Dr. John Bell, New Glasgow.

PRINCE EDWARD ISLAND MEDICAL ASSOCIATION:—President—Dr. A. A. MacDonald. Secretary—Dr. W. J. MacMillan, Charlottetown.

REGINA MEDICAL SOCIETY:—President—Dr. Gorrell. Secretary—Dr. Dakin.

ST. JOHN MEDICAL SOCIETY:—President—Dr. D. Malcolm. Secretary—Dr. F. P. Dunlop.

ST. THOMAS MEDICAL ASSOCIATION:—President—Dr. D. L. Ewin. Secretary-treasurer—Dr. James A. Campbell.

SASKATCHEWAN MEDICAL ASSOCIATION:—President—Dr. G. P. Bawden. Secretary—Dr. C. G. Sutherland, Moose Jaw.

SASKATOON MEDICAL ASSOCIATION:—President—Dr. T. W. Walker. Secretary—Dr. J. T. Mackay.

SWIFT CURRENT DISTRICT MEDICAL ASSOCIATION:—President—Dr. Graham. Secretary-treasurer—Dr. Hughes.

THUNDER BAY MEDICAL SOCIETY:—President—Dr. R. J. Manion. Vice-President—Dr. Eakins. Secretary-treasurer—Dr. J. G. Hunt.

VALLEY MEDICAL SOCIETY:—President—Dr. M. E. Armstrong, Bridgetown. Secretary—Dr. T. M. MacKinnon, Berwick, N.S.

VANCOUVER MEDICAL ASSOCIATION:—President—Dr. W. D. Keith. Secretary—Dr. J. H. MacDermot.

WEST ELGIN MEDICAL SOCIETY:—President—Dr. Crane, Wallacetown. Vice-President—Dr. Webster, West Lorne. Secretary-treasurer—Dr. Smith, Fingal.

WINNIPEG MEDICAL SOCIETY:—President—Dr. James McKenty. Secretary—Dr. D. F. McIntyre.

The Canadian
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THE MEDICAL PROFESSION AND THE WAR—THE CANCER PROBLEM

By W. H. B. Aikins, M.B.

*President Academy of Medicine, Toronto**

At a time like the present when such momentous events are happening day by day on the Continent of Europe, and the destinies of the nations of the world are trembling in the balance, most of us find it extremely difficult to concentrate our minds on any subject which is not directly or indirectly connected with the war. This is not to be wondered at when we consider that it is by far the most terrible conflict recorded in history, the result of which will influence the future course of events throughout the whole of the civilized world. The state of things in Europe has been recently very vividly brought home to us in Canada, owing to the fact that so many of us have already lost those near and dear to us on the battle-field or in that great tragedy of the sea, the sinking of the *Lusitania*, but we rejoice to know that our soldiers have worthily upheld the traditions of our race, and that this country has reason to be proud of her sons.

In no previous war has the medical profession, not only of the British islands, but also of the overseas Dominions, played such an important part, and there has been everywhere a prompt response to the demand of the army for civilian surgeons to supplement the work of those belonging to the service. Many of the senior students in the various medical schools also volunteered for employment as dressers.

As you all know the response from those of our profession in Toronto has been most gratifying. The Army Medical Service of the First Contingent took many of the Fellows, and with the subsequent contingents, Clearing Hospital and University of Toronto Base Hospital, there has been an increasing depletion of our ranks. Sixty-one Fellows of the Academy of Medicine are now on active service. The medical student body of Toronto University has not been behind in their response to the call. Of the undergraduates in medicine, six officers and eighty-eight men have gone, while there are two hundred and fifty-two men serving from the graduate body of the Faculty of Medicine.

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* Address given before the Academy of Medicine, October 5th, 1915. Received for publication October 15th, 1915.

You will remember that very soon after the beginning of the war the Fellows of the Academy of Medicine pledged themselves as a patriotic duty to undertake without charge the professional care of the needy dependents of any men serving with the allied armies during the war now going on; and you have this evening listened to the report of the Patriotic Relief Committee, and can realize how well and truly that pledge has been supplemented by the Fellows of the Academy. From the report of the Hospital Supplies Committee you have also learned how very active the Fellows have been in this matter.

From all parts of the country came offers from private individuals of accommodation for invalid soldiers and sailors, and of large country houses to be used as convalescent homes for the sick and wounded. Australia, New Zealand, South Africa, India, and our own Dominion of Canada, have given splendid and magnificent assistance in hospital equipment and personnel, and in the sermon preached by the Archbishop of Canterbury at St. Paul's Cathedral on August 4th, the anniversary of the declaration of war, he says that "the temper of the whole of the British Empire has been worthily reflected by Medicine. A firm resolution to endure to the end and a hope for the victory of the right are displayed in the hearty coöperation between our citizens in all parts of the world in the medical conduct of the war." The United States has also done much to help in the treatment of our wounded soldiers, and has made generous contributions in the shape of hospital equipment and personnel.

The war can scarcely fail to have a more or less arresting effect upon medical progress in some directions, in view of the fact that in all the countries concerned so many men engaged in medical investigation and research have, at any rate for the time being, been called away from their work. The interruption to the exchange of scientific data is also a serious obstacle to progress. Many medical meetings which were to have been held during the present year have been postponed. The next International

Congress which was arranged to meet in Munich in 1917, has suspended the work of organization, and in the *Deutsche Medizinische Wochenschrift* there is an editorial to the effect that it is probable that the feelings of hatred excited by the war will not have died out by that time, so that it would be difficult to welcome representatives of the countries now fighting Germany with any degree of cordiality. In fact, Germany seems to be preparing for isolation from the external medical world, and it is announced that the German scientists have commenced a campaign against all medical works of English, French and Russian origin, and that a committee is to be formed for the purpose of framing a purely German medical nomenclature.

This isolation from the rest of the world may not be an unmixed evil if the opinion expressed by Dr. Greely in the *Boston Medical and Surgical Journal* of September 10th, 1914, is correct, namely, that in Germany the scientific side of medicine is over-developed, whilst the human side is greatly neglected.

The sublime ignorance of the facts in regard to the origin of the war shown in the extraordinary manifesto issued towards the end of last year by the German Intellectuals including such names as the late Professor Ehrlich, some of the assertions in which are in direct opposition to the statements contained in the German White Book, cannot fail to discredit German science. Can we ever trust the German scientists again?

Soon after the beginning of the war we began to realize how dependent we are upon Germany for the supply of certain drugs, in the manufacture of which she had acquired a monopoly. These included a large number of extremely valuable drugs, which had displaced many of the older remedies, such as the whole range of synthetic drugs, analgesics, antipyretics, alkaloids, salicylates and potash salts. The fact that Germany possessed a monopoly in the manufacture of aniline dyes has caused a very considerable inconvenience. The manufacture of many of these products had originated in Britain, but had afterwards been applied by German manufacturers. One of the chief difficulties in manufacturing them ourselves was that hitherto Germany had had an exclusive supply of the raw material required. There has since been considerable progress in the manufacture of the products formerly supplied by Germany, but there are still many difficulties to overcome before this industry is established on a satisfactory basis.

It is sometimes asked if war offers any compensations for the harm it undoubtedly does in hindering the advance of science?

Much has already been learned in regard to the proper treatment of septic wounds, and as to efficacy of inoculation in the prevention of the diseases which have in previous wars caused more deaths than the actual battles themselves. The vigorous efforts taken in Serbia by the British and American doctors have been so successful that typhus, relapsing fever, cholera and smallpox are now almost stamped out, and so far the health of our troops in France, in England and at home has been extraordinarily good.

At the end of the first year of the war it may be said that the value of the medical work in the army cannot be too highly estimated, and the practical absence of epidemic disease and efficient sanitary organization has meant a gain of innumerable lives to the allied armies. The heroism of the troops in battle has been equalled by that shown in the hospitals, and the wounded have been attended with courage, assiduity and success, often under the most trying circumstances. Very warm tributes have been paid to the courage and professional efficacy of the Medical Corps by the highest military and political authorities. They all agree that the medical men have rendered most heroic services, and that their courage and devotion is beyond all praise.

I quote the following paragraph from the *Daily Mail*, which appeared soon after the battle of Neuve Chapelle: "A bright page in the story of British heroism in the battle of Neuve Chapelle is the conduct of the doctors. As always they distinguished themselves by their fearlessness under fire and their gallantry. Their losses were heavy for they exposed themselves without thought of danger."

Amongst the results of the war which are of special interest to us in Ontario is the establishment of medical reciprocity between Ontario and Great Britain. This became necessary on account of the necessity for those holding the license of the College of Physicians and Surgeons of Ontario to go with the Canadian contingents to Great Britain and France, and therefore to work under the War Office. The Council of the College passed the enabling legislation in December last, the Lieutenant-Governor subsequently giving the royal assent. In the *Lancet* of September 4th, a notice appears from the Registrar General of the Council of Medical Education and Registration of the United Kingdom containing the following paragraph: "That any person holding the license or membership of the College of Physicians and Surgeons of Ontario, granted after examination in medicine, surgery and midwifery, together with a license to practice in that province, shall be entitled to register in the

Colonial list of the Medical Register, providing he satisfied the Registrar regarding the other particulars set for in Part 2 of the Medical Act, 1886. Degrees in medicine granted by the Queen's University, the Western University and the University of Toronto may so be registered as additional titles provided they are registered in Ontario."

It has been assumed by some that this war is likely to result in an enormous amount of more or less permanent nervous and mental suffering and incapacitation amongst the soldiers, but although there is no doubt that a certain number of them became unnerved by the horrors of the battle-field, time has shown that a large proportion of these recover after rest and suitable treatment. In an address recently given by Lord Bryce he states that the effect of the fighting on thousands of our men has been to sober them, to stir their deepest thoughts, and inspire them with an urgent desire for a more idealistic basis of living, and he holds that the spectacles of millions of men abandoning home, family, ambition and money, and laying down life for a principle is so glorious as to transfigure the pictures of mangled bodies and human beings gasping in the dark struggle against death. He believes that one of the eventful results of the war will be the great decrease in the amount of mental instability, and that people will return to a simpler life, partly from choice and partly from necessity.

Another fact of importance which we may here mention is that neurasthenia and other neurotic conditions are apparently becoming much less common, in spite of the anxiety and strain resulting from the war. This is not difficult to understand, as the experience of most people who have been accustomed to the treatment of nervous conditions indicates that it is not so much the great tragedies of life which are apt to upset the equilibrium of the nervous system but small daily worries persisting for long periods of time, and above all lack of occupation and interest in life.

This war is certainly affecting the Fellows from a pecuniary point of view in that many people who have been accustomed to employ physicians and pay the ordinary fees can no longer afford to do so. The extent to which the war has affected the medical profession in this respect varies in individual cases, but there certainly seems to be no doubt that consultants and specialists are suffering more than the general practitioners, who in a few cases are benefiting more or less, due to so many of their colleagues having taken up military work of some kind.

Now as to the progress of the Academy since the last regular meeting was held, I may say that 27 new men have been elected so that counting in the 61 who are at present overseas the total number of resident Fellows is 404, non-resident Fellows 42, life Fellows 5 and honorary Fellows 4, making a total of 455. Ten additional names will be submitted at the next council meeting for election, and it is our earnest hope before the close of this Academy year the total fellowship may come up to the 500 mark by the adhesion of a number of very able men in Toronto who have signified their desire to join with us.

THE CANCER PROBLEM

Until comparatively recently it was believed that cancer occurred only in human beings, but the researches which have been carried out have demonstrated the fallacy of the opinion, and it now appears to be definitely established that both benign and malignant growths may develop in any multicellular organism. In the report of the Imperial Cancer Research Fund, Bashford and Murray state that the results of their investigations indicate that all the histological types of cancer have been recognized both in domesticated and wild animals, although in the latter it is comparatively rare. As regards the domestic animals, it is most common in dogs, but it has also been observed in horses, cows, donkeys and cats, and a few isolated cases have been observed in pigs, sheep and goats. In domestic birds such as hens and geese, it is fairly common, and the same applies to fish, more especially when they are artificially bred. It is much more rare in wild animals and birds, although there is evidence to show that they are by no means exempt from it.

As regards man, there is no doubt that it is one of the most terrible diseases which afflict the human race, and that it is responsible for a very large proportion of the deaths from disease in general. Whilst it is unwise to over-estimate the value of statistics, there is no doubt whatever that the endeavours which have been made during the last few years to obtain more accurate statistics in regard to cancer and its mortality have given most valuable information in regard to its geographical distribution, the comparative frequency with which it affects the different organs of the body, and the apparent influence of various occupations on its incidence. The results of these researches indicate that the view which formerly prevailed that cancer affected only civilized races, and that those living under primitive conditions of life and in certain climates were exempt from it, has no foundation in fact, and that it is prevalent to a varying extent amongst all races of the world and in all climates.

As regards the mortality of the disease, a study of the English statistics shows an alarming increase in the fatalities from it during the last few decades. In 1840 the reports show that one person in 5,646 of the total population of the country died from malignant disease; there was one death from it in every 129 deaths recorded, and there were 117 deaths due to cancer per million of the population. On comparing these figures with those for the year 1906 we find that one person in 1,131 of the total population died from malignant disease; that there was one death from it in every 17 deaths recorded, and that there were 885 deaths due to cancer per million of the population.

On the continent of America we also see a corresponding increase in the death rate from cancer. In New York the death rate from malignant disease in 1913 was 82 per 100,000 of the total population, whereas from the previous five years the average was 79 per 100,000, in Boston it was 118 per 100,000 as compared with an average for the previous five years of 110 per 100,000; in Pittsburg 79 per 100,000, as compared with 70 per 100,000 for the previous five years; in Baltimore 105 per 100,000 as compared with 94 per 100,000 for the previous five years; in Chicago 86 per 100,000 as compared with 81 per 100,000 for the previous five years; in Philadelphia 95 per 100,000 as compared with 88 per 100,000 for the previous five years; and in St. Louis 95 per 100,000 as compared with an average of 85 per 100,000 for the previous five years. The mortality statistics for the whole of the United States give in 1900 a death rate from cancer of 63 per 100,000 of the total population, in 1904 of 70·2 per 100,000, in 1909 of 73·8 per 100,000, and in 1912 of 77 per 100,000.

As regards Canada we find that in our province of Ontario the annual death rate from cancer has increased from 1,253 in 1904 to 1,806 in 1913. This last figure is a fraction above four times as many as those from typhoid fever in the same year, and very nearly as many as those from pulmonary tuberculosis, which claimed 1,955 victims in 1913.

Werner, who has made an investigation of the vital statistics of Baden, states that during the last twenty-five years the yearly number of deaths from cancer has increased by about one third in this part of Germany. Bertillon, who has made a similar investigation in regard to France and most of the other countries of Europe, states that it has been doubled in frequency during the last thirty years.

These figures are certainly alarming, and it is therfore not to be wondered at that a considerable amount of attention has recently been devoted to the problem of the most effectual means of diminishing the incidence and mortality of cancer. At the same time it should be borne in mind that there are certain factors which tend to modify this increase in mortality, and indeed some writers go so far as to say that in their opinion it is only apparent and not real. These modifying factors include the imperfections in the systems of vital statistics which are employed in different countries, and the recent improvements in methods of diagnosis of cancer and other diseases, which renders it probable that an accurate diagnosis is made of malignant disease much more frequently than was formerly the case. Further, it is a generally recognized fact that cancer is more apt to develop in people over forty years of age than in younger individuals, and as the average duration of life has increased, it follows that a larger proportion of people now live to attain this age. But even when due allowance is made for scientific progress and the changes in modern conditions of life there seems to be no doubt that the mortality from cancer is steadily increasing, and that if this increase cannot be checked its ravages in the future will be terrible to contemplate.

The problem of cancer is therefore one of vital importance to humanity in general, both from the point of view of prevention and treatment. Societies have been formed in practically all civilized countries in the world with the object of carrying out scientific investigations to determine its ætiology, but so far although the hypotheses advanced in this connexion have been manifold, very little light has been thrown upon it. The quest for its causative agent is analogous to that which was persevered in for so many years without result in the case of tuberculosis, and was at length rewarded by the discovery of the tubercle bacillus. We still remain more or less in the dark with regard to cancer, but there is no doubt that some day in the near or distant future this problem, which is now occupying the attention of so many of our greatest scientists, will also be solved.

Contrary to many popular ideas, the investigations of the Imperial Cancer Research Fund have shown that cancer is prevalent amongst both civilized and uncivilized people, amongst all races of mankind and in all climates. It has often been assumed that certain countries, such as India, China and Japan, are comparatively immune to malignant disease, but the results of recent researches indicate that it is by no means so rare in those countries as has generally been supposed. Indeed, the Japanese statistics for the four years from 1899 to 1903 give the average death rate from it as 0 49 per 1,000, which is higher than that of some of the European countries. Werner and Bertillon have published some interesting statistics with regard to the geographical distribution of cancer. Werner found that its prevalence appeared to be independent of climate, geological or similar conditions, and that areas in which it was very common and comparatively rare were frequently situated close to one another. In some instances it was rare in districts in which the proportion of the inhabitants over fifty years of age was small, and common in those in which there was a comparatively large proportion of individuals of advanced age. Bertillon found that it was much more common in the north than in the south of France, and that in the area of greatest mortality from this disease, which is situated around Paris, the mortality from it is from three to four times as great as in other parts of the country. The statistics of deaths from carcinoma in other European countries show that the mortality from it in the Mediterranean countries in the year 1906 to 1907 was less than half that in the others. While it is probable that some definite peculiarities are at the basis of the differences in the geographical distribution of cancer, they have so far not been discovered.

I do not propose here to discuss the many theories which have been advanced from time to time to account for the origin of cancer, none of which affords a satisfactory explanation of the nature of malignant disease. The fact, however, that we are up to the present ignorant of its actual cause does not prevent our attacking the problem from the standpoint of prevention and cure. The researches which have been carried out have definitely shown that there are certain predisposing causes, the most important of which is chronic irritation of various kinds, dependent upon mechanical, physical, thermal, chemical or other irritants. In some exceptional cases which have been reported the irritation has not been chronic, but has been the result of a single trauma. In addition to local predisposing causes there appear to be certain constitutional peculiarities, which lower the resistance of the organism to this particular disease. Experimental work in mice and other animals has shown definite constitutional susceptibility to cancer, both of the natural and acquired type. People who follow certain occupations are also known to be especially liable to the development of malignant disease. The fact that we now know that such predisposing cause are influential in setting up cancer indicates the desirability of keeping a careful watch for them, and more especially of removing all sources of chronic irritation, where it exists, and of all benign growths which are being subjected to irritation.

There seems therefore to be no doubt that chronic irritation sometimes of long duration followed by what may be termed a precancerous condition, does in a very large proportion of cases precede the development of cancer. This is most clearly seen in cancer of the skin and mucous membranes, a very striking instance being the development of cancer of the tongue on the basis of leucoplakia. Von Brunn was able to determine previous chronic irritation in 328 of 368 cases of superficial cancer which came under his observation. Lesions of the skin from which cancer may develop include warts, certain varieties of pigmented moles, chronic ulcers, sinuses and old scars from burns. With regard to the internal organs the connexion between chronic irritation and cancer is not so easily demonstrated, and there is considerable difference of opinion as to the influence in this connexion of ulcer of the stomach, gall stones and urinary calculi.

As has already been said, the increased incidence of cancer affects mainly the higher age periods, and in the majority of cases it develops in individuals over forty years of age. It is said that after the age of forty, one woman of every seven and one man of every eleven, dies from cancer. The age of the patient is therefore of importance in making a diagnosis of malignant disease, and symptoms, which in people of an earlier age, may possibly be of slight significance, increase in importance as age advances. For example, vague and indefinite symptoms of gastric distress in a man of forty-five should not be ascribed to mere functional derangement without the most careful and thorough examination, with a view to excluding organic disease. Cancer below the age of thirty-five is rare, but it has been met with exceptionally in much younger individuals.

It is a well known fact that certain organs of the body are more liable to develop cancer than others, this predisposition of definite tissues varying according to sex. Thus in men the following are attacked in order of frequency: stomach, liver and gall-bladder, rectum, intestines, œsophagus, tongue, jaw, mouth, lip and breast. In women the order of frequency is as follows: uterus, breast, stomach, liver and gall-bladder, intestines, rectum, œsophagus, bladder and urethra, face, tongue, jaw, mouth and lip. Cancer of the uterus and that of the female breast form by far the largest percentage of all cancers. The increase in the incidence of cancer as a whole, however, during recent years applies chiefly to cancer of the stomach and rectum, whilst that of the female genital organs has remained practically stationary, and is even said by some writers to be diminishing in frequency.

The investigations which have been carried out do not indicate that environment has much influence upon the incidence of cancer. The one exception to this general rule is that in certain occupations there appears to be a tendency of special parts of the body to the development of precancerous or cancerous conditions owing to exposure to chronic irritation. This applies especially to workers in coal tar, soot, petroleum and aniline dyes. The returns of the Registrar General for England and Wales shows that the greatest mortality from cancer occurs in chimney-sweeps.

It is therefore beyond all doubt that malignant disease is on the increase. What is then the duty of the medical profession? Scores of workers are seeking the etiology of cancer. Others are devoting themselves to the discovery of some sure method of diagnosing the disease early enough to make our present treatment more potent. Still another band of scientists is searching out new remedies and methods of treatment, or improvements of those we already have. Till one or all of these groups is successful, the great body of the medical profession must be content *first*, to educate the public as to the early symptoms of the disease, so that the patient will present himself to the physician while the growth is removable and, *second*, to use every known means to diagnose carcinoma when these patients come to him.

We must look forward to the time, not far distant, when the laity are going to take as active a part in the campaign against cancer as they now do in the treatment and prevention of tuberculosis. I trust that when the public do become fully aroused to the dangers of this disease, the medical profession may be in a position to lead them up to the sanctuary of cure.

AIDS IN THE DIAGNOSIS OF SURGICAL CONDITIONS OF THE STOMACH WITH ESPECIAL REFERENCE TO THE CHARACTERISTIC *X*-RAY APPEARANCE OF THE SYPHILITIC HOUR-GLASS IN CONTRAST TO THOSE OF SIMPLE ULCER AND CANCER.*

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IT is unusual for a medical man to present a paper on the diagnosis of surgical conditions. It seems only fair, however, that we should adopt such retaliation, particularly when the trouble concerns the abdomen, because our surgical friends consider this region their especial province, and their opinion a sort of court of first and last appeal. We grant at once that all the following diseases are or may be surgical: cancer, sarcoma, benign intragastric tumors; ulcers and their complications, and in rare cases syphilitic ulcer.

I wish to emphasize the value, in diagnosing these conditions of the stomach, of some of the old and well-tried methods and tests. There are many valuable aids that I shall not refer to. One purpose is to stimulate in some degree, if I can, a return of your interest to these methods in general; and not only those which apply to affections of the stomach. It has been said that if we would enforce such laws as we have we should fare better than by ever legislating new laws: so, I believe, if we would only use our well-tried clinical tests, we should have less room for a multiplicity of new ones. On the other hand, any new test, preëminently good, should be added to our old stock. It is not only the older of us who have seen, time and time again, new methods heralded as a finalty, but later cast aside as unfit. So many new tests cause perplexities and tend to shake the physician's confidence in himself and his ability to make diagnoses; but this need not be if he

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would apply his knowledge of common methods, and now and then learn some of the newer tests.

Cancer is the most fatal and dreaded of all diseases of the stomach, and it is most important to determine its presence in the early stages, when it is amenable to surgery; further, many cases of cancer which in the recent past have seemed hopeless surgical risks are now considered operable.

How can we make an early diagnosis? A carefully elicited and interpreted history is very important, often the most important evidence; but, sometimes, the symptoms manifest themselves suddenly and the disease is already advanced when these appear,—perhaps an inoperable growth already exists when the history begins, and with our present knowledge we can offer no hope of cure in such a case. Often symptoms occur early in the disease, and with a good history and physical examination, and a careful application of the simple tests, we may frequently diagnose the disease in the curable stage. If we cannot conclude by such methods, we should use every other means possible,—lingering doubt may be fatal to the patient.

Latent cases of cancer are illustrated by the following: A vigorous appearing man fifty-six years old, always previously well, was taken sick at a picnic with nausea and epigastric distress, he was not relieved and in a few days began to vomit. Two weeks passed with no relief; he called his physician who, upon washing out the stomach, found blood and absence of free HCl. Three more weeks passed, the patient continuing to vomit, losing blood and becoming anæmic and weak. He was urged to have an exploratory examination. Further treatment with absolute rest in bed did not improve the symptoms, and operation was done by Dr. William Jason Mixter, of Boston, who found a malignant growth occluding the pylorus. A posterior gastro-enterostomy was performed. Gastrectomy was thought inadvisable, both on account of the extent of the growth and the much weakened condition of the patient. I could cite similar cases illustrating absent or unnoticed symptoms of cancer but they are chiefly in the upper portion or fundus of the stomach—the pylorus not being involved.

When a previously healthy middle-aged person develops intractable dyspepsia, it indicates cancer, and the physician should, without waiting, exhaust all means at his disposal in arriving at the cause of the trouble.

It is remarkable to what extent a cancerous growth may invade the stomach without attracting the attention of either patient or physician to this organ, as the following shows: A woman, aged fifty-four, always well, immediately following an attack of seasickness, began to have fulness in the stomach after eating, soon followed by cramps in the bowels and loose movements. No pain in stomach; no vomiting. Appetite good, but amount and kind of food restricted because of epigastric fulness after eating, but chiefly because of cramps in bowels and diarrhœa. She would eat "five or six times a day and still be hungry." *Meats* of all kinds agreed best, also dry bread and toast and cold water—hot drinks distressed as did also milk, and eggs especially. She could eat few vegetables and "no fruits except strawberries." At the end of a year and a half she had lost thirty pounds in flesh, symptoms continuing about the same. At this time two specimens of fæces gave strong positive reactions for occult blood both with benzidin and guaiac. Patient refused to leave home for investigation of condition. Four months later she had lost in all forty pounds—weight eighty-six pounds; Hb. 70 per cent. Though emaciated, she had fair strength and could go about the house. There was a small movable mass in the epigastric region above and to right of navel; no abdominal tenderness anywhere, and no enlarged glands. No ascitic fluid was noted. Twenty minutes following Ewald test breakfast, only 2 c.c. or 3 c.c. of contents was obtained, showing no free HCl, but combined acid, and trace of occult blood with benzidin. Fæces showed *no occult blood with guaiac* and only *a slight positive reaction with benzidin. X*-ray showed a long uniform tube about one and one-half inches in diameter representing the stomach, and in six minutes following ingestion of bismuth this had nearly reached the cæcum —no peristaltic waves were seen in the tube-shaped stomach except in tip of antrum. Diagnosis: Diffuse cancer of stomach wall. Exploratory operation by Dr. Torr W. Harmer, of Boston. Escape of pale coloured fluid—not blood tinged—on opening abdomen; stomach long and rather tubular; running whole length of lesser curvature and surrounding pylorus, and extending two-thirds way along greater curvature was a hard, smooth, infiltrating tumour mass of dull pearly white and coursed by unusually few blood vessels,—a blanched appearance. Posterior wall was equally involved and so firm and incompressible that the stomach was converted into a rigid tube or trough; there were many glands in the gastrocolic omentum and some infiltrating growth; omentum was practically devoid of fat but very vascular. No masses in liver. Operative measures either not justified or not feasible.

This history, like the previous one, emphasizes the importance of considering cancer when there is a sudden onset of persistent stomach or bowel trouble in a healthy person of middle age. It is remarkable that meat should have been craved by the patient when meat is usually repugnant to those suffering from cancer of the stomach,—it is so frequent as to be considered pathognomic. Though cancer may reach advanced stages without pain, it is uncommon to find it so when the disease has invaded the peritoneum. Demonstrable free fluid ought to prohibit exploratory operation looking towards gastrectomy, but it was not detected before operation in this patient. This record shows, too, the possibility of a *negative guaiac* for occult blood in the stomach contents as well as in the fæces, *in the presence of advanced cancer.* There was no blood in the aspirated stomach contents partly because this was obtained from the stomach cavity above the cancer, and none in the fæces because of the scirrhous type of growth. There was no cachexia in this case of advanced scirrhous cancer of the stomach, and there had been looseness of the bowels from the beginning of the symptoms. The cachexia in cancer is chiefly due to the hæmolytic product of the growth, and if the bowels are free, in cancer of stomach or bowel, the poison is, to a certain extent, eliminated. I have observed this association before and wonder if it is fairly constant. It is known that cancer and a history of constipation are usually associated.

The absence of free HCl is suggestive of malignancy, *especially if there be still combined acid present.* It is rare to find achylia,—absence of free as well as combined HCl and the enzymes,—in cancer of the stomach even in late stages. When we do find "achylia gastrica" with absence of occult blood in the stools, in fact, whenever *we repeatedly find the fæces blood-free* by such a delicate test as the benzidin, we may be pretty sure we are not dealing with cancer of the gastro-intestinal tract. We do find normal acidity in cancer, particularly in early cases, even hyperchlorhydria has been reported, but I have never seen a case and they are very rare. The lactic acid test is of some value; it is simple and quickly done and favours the presence of cancer.

Occult blood, (that is blood not seen by the naked eye and only evidenced by chemical or other means) is rarely absent either in the stomach contents or in the fæces in cancer of the stomach,—that is by the benzidin test, not always with the guaiac test. There is no occult blood in the achylias. (In testing for occult blood in the stools, be very sure the blood does not come from hæmorrhoids, and that the diet is absolutely blood-free, and that the bowels have been emptied on beginning the diet. Do not depend upon one test, but make tests on three or four successive days. There are so many chances of error, we must be very careful in accepting a positive occult blood test from stomach contents obtained by tube.)

A gain of weight does not always decide against the presence of cancer. This may occur for a short time in some cases under proper treatment. Pain is a pretty constant symptom of cancer, and differs from ulcer in that it is little influenced by food, and may occur at any time during the day or night, and is often a constant Nemesis. As shown above, pain *mqy be entirely absent*, so we must not be misled by its absence.

Our greatest single aid in detecting cancer of the stomach, and in differentiating this from ulcer is the x-ray. It is not so easy, however, to differentiate cancer from syphilitic ulcer of stomach; and, I regret that even the x-ray may fail to detect cancer near the cardia,—two of the most expert x-ray specialists in America failed, on separate occasions, to demonstrate its presence in one of my patients. Exploratory operation was done here upon the findings of ordinary clinical methods, only to show a large inoperable growth. I know that some of our x-ray specialists would make strenuous objection to this statement, and reply that the x-ray was not at fault,—that the growth was shown but not interpreted. Even so, I believe that had the patient been x-rayed a month earlier,—when the growth would still be considered in an advanced stage,—no registered evidence would have occurred with our present x-ray methods, and therefore could not be detected. I am sure, though, this difficulty will be overcome by improvement in technique. We are in the profession to find out the cause of ills, and to cure them, and gladly accept aid from every source. What I have said is not intended to militate against the value of x-ray in cancer: in the lower two-thirds of the stomach, the x-ray examination ought to show cancer in every case, if properly done and correctly interpreted; further, *in the majority of cases*, it will detect cancer much earlier than we could hope by clinical methods. But what we most want at present is physicians sufficiently trained to scent the trouble afar, and not treat as simple dyspepsia what may be a serious ailment.

Another important point for consideration is, how can we determine when cancer of the stomach is surgical, and when inoperable? X-ray is an aid, but the chief means here are the ordinary methods and the experience and judgement of the clinician.

Opening the abdomen will, probably, never be devoid of risk, and we must strive to avoid unnecessary exploratory operations. Real cachexia or great weakness prohibits; weakness and a low hæmoglobin would prevent a gastrectomy, but not a gastrostomy nor a gastro-enterostomy (and here an anterior operation may be more feasible, and therefore is as good and much safer and quicker than a posterior operation). Demonstrable ascites, as a rule, ought to prohibit exploratory operation in cancer of stomach because it means malignant invasion of the peritoneum. In cases of cachexia we usually have advanced secondary growths, but even if not, gastrectomy would hardly be permissible though other operations might be. I believe in gastrostomies for obstructive cancers of the cardia, even though these patients may tell you that, had they their choice again, they would choose the short cut rather than prolong life by means of a gastric fistula.

A large palpable mass does not prohibit a radical operation, neither should the surgeon always desist from a gastrectomy because of enlarged mesenteric glands which cannot be removed, nor because he cannot get a big margin of apparently healthy tissue.

To show what seemingly desperate conditions may be operated upon and cured, I will refer to the patient of Dr. Farrar Cobb, of Boston. A man, forty-seven years old, had a large palpable mass in the epigastrium, typical of advanced cancer of the stomach. Exploratory operation was decided against, at first, but later done after earnest solicitation of the patient. An ulcerated cancerous mass, the size of an orange, and a smaller one nearby, occupied the middle of the stomach. As the stomach was free and the liver not affected, Dr. Cobb took a desperate chance and removed about two-thirds of the stomach, attaching the bowel to the portion left. After about twelve years the growth has not returned, and the patient is able to do hard labouring work. In recent years even more desperate cases than this have been reported, many showing excellent results and no return of growth.

I believe that, for the present, surgery should be the treatment in all early cancers of the stomach, but the reverse is true of ulcer of the stomach and duodenum; and some of us are not ready now, as in the recent past, to assign to surgery *even a majority of chronic ulcers* of the stomach. There is one especial exception to this statement: All acutely perforated ulcers are immediately surgical; and, I would like to emphasize the importance of every practitioner becoming familiar with symptoms of this emergency, so often overlooked with disastrous consequences. It is seriously reprehensible to treat for acute indigestion a patient suddenly attacked with severe pain in the stomach, localized tenderness and spasm, until we are sure it is not perforated ulcer, appendicitis, gall-stones, or acute pancreatitis. A history of heartburn, sour eructations, epigastric distress and pain—in fact an ulcer history—is usually present, and will often decide us aright even after the abdominal signs become general and marked.

Now, what should we call chronic ulcer? How do we diagnose the condition, and when do we consider it surgical?

First, nearly all ulcers are chronic when seen by the physician, and I believe many of them get well under medical treatment. Abdominal operations upon patients following gastro-enterostomies for gastric ulcers (personal observations) have proved to me that even indurated ulcers do heal, leaving no appreciable evidence behind. In one case a gastro-enterostomy was done by Dr. A. J. A. Hamilton, of Boston, upon a man with a large indurated ulcer of the lesser curvature about two and one-half inches above the pylorus, and, three and one-quarter years later—absolutely well for the first three years—he was again operated upon by Dr. Charles L. Scudder for a peptic jejunal ulcer, but no evidence of the old gastric ulcer remained. In another case a gastro-enterostomy was done by Dr. Hugh Cabot for an indurated duodenal ulcer, in addition to a chronic perforating ulcer on the posterior wall of the stomach near the lesser curvature. There was little abatement of symptoms, and a year later the gastric ulcer was excised. At the second operation evidence of the duodenal ulcer had almost disappeared. For more than three years since the operation the patient has been quite free of stomach symptoms.

Some extremists among the internists are so convinced of the probability of ulcers healing that they would persist in the medical treatment of practically all ulcers,—that is, absolute rest, very frequent small meals, and ingestion of antacids at short intervals, with the belief that the ulcers will not only heal, but that the indurations and most contractures will disappear. I do not believe all this, but it is difficult to say, precisely, where the line should be drawn,—it is mostly a matter of good judgement: it does not seem likely that an ulcer of the stomach or duodenum with a history of twenty or thirty years duration can be cured with a month or two of medical treatment of any kind; especially would surgery seem the best remedy if persistent pyloric obstruction were not relieved after careful application of the medical measures to which I have referred, and whether or not we considered pylorospasm the chief cause,—and in most cases of pyloric obstruction pylorospasm is a prominent factor.

Second, I believe the most important part of the investigation of ulcer and all gastric conditions is a careful anamnesis; roughly, I would put its value at about 50 per cent. of the evidence. Sometimes the first few statements made by the patient will contain the essential evidence for establishing a diagnosis; in others, only by repeatedly questioning the patient at various times are we able to elicit a good history; finally, there will be rare cases where the history gives no aid. Get the patient's own story first, with no more guiding than to aid in brevity. The ability to obtain and interpret a history increases with the physician's experience and knowledge; and the older physician need have little fear of being overtaken by the younger man ifhe is constantly observant of this and is careful of his other work.

Very important, I believe, are the laboratory examinations, notwithstanding that some have declaimed against them. We nearly always have hyperchlorhydria in ulcer, and usually associated with occult blood in the stomach contents or stools, or both. Occult blood is most inconstant: I once saw the washing of a stomach show no occult blood with benzidin, though there was present a large indurated ulcer, and the patient had even vomited blood two days before. Again, occult blood may be absent from the gastric contents obtained from above a constriction, as in an hour-glass due to cancer or ulcer. An examination of the fæces, too, often shows no blood in ulcer, and we should examine such specimens on three or more successive days. The finding of food elements in the fasting stomach, even if only microscopical, is strongly suggestive of pyloric stenosis, temporary or organic, especially if there be a history of having vomited food eaten on a previous day.

The physical examination in both ulcer and cancer sometimes gives negative findings. The epigastric tender spots and spasm of the recti are good contributary evidence when present; but, many times, I have been unable to palpate even large malignant growths when situated high in the epigastrium, and, as I have already stated, the x-ray examination *may not show such tumors in this locality*. Again, I have found masses in the epigastric region formed by a rolled-up omentum, or by an omentum attached to the base of an old ulcer, and in one case the tumor was formed by the edge of the liver which had become adherent to the base of the ulcer. In all these cases I decided against the diagnosis of cancer because of hyperchlorhydria, and each time chronic perforated ulcer was proved by operation. Tenderness or pain over the lower dorsal and upper lumbar vertebræ (Boas' point and also Cruvielhier painful area) are valuable signs when present, indicating chronic perforated ulcer; these signs are present sometimes in cancer, but the pain differs in character. Such points help us to differentiate between primary stomach troubles and symptoms dependent upon diseased appendices and gall bladders and various other abdominal conditions.

The x-ray ought to show nearly all ulcers of the stomach but, as in cancer, I have seen them overlooked especially when near the cardia. I heard a well known and prominent roentgenologist remark that he could demonstrate all ulcers of the stomach that are surgical: I agree in great part, but would further add, *and show many that are not surgical.*

Finally, when are these chronic ulcers of the stomach surgical? I consider the following are surgical conditions: chronic pyloric obstructions not permanently relieved by rest, diet, alkalies and atropine; permanent hour-glass contractions of stomachs; rare cases where pain and distress, sour regurgitations and intractable dyspepsia do not yield to proper medical treatment but become intolerable; and, finally, ulcers which persistently have severe hæmorrhages. These ulcers involve the larger arteries, and a fatal hæmorrhage is liable to occur at any time, as I have witnessed. I believe the treatment should be excision or circular gastrectomy in such cases, and this without gastrojejunostomy, unless the pylorus is obstructed. With the exception of pyloric obstruction, and regardless of statistics, I am approaching more and more the belief that gastro-enterostomy alone is not the best remedy for ulcer. Let the surgeon resect the ulcer, if necessary, and omit the gastro-enterostomy, but let the internist advise the patient as to how to prevent the recurrence of the trouble. I am even strongly doubting that simple round ulcer is the usual precursor of cancer,—that such a large percentage of cancers of stomach, as figured out, are the result of simple ulcer. It may seem like egregious assumption to hold such a view in face of the Mayo statistics and those of others; but, one cannot be unmindful of personal experience. Such conviction may be untrustworthy and dangerous, but on the other hand statistics are dangerously dogmatic. Besides, all statistics do not agree here: de Quervain* of Berne, Switzerland, believes that "the most reliable data must be obtained from the further observation of patients subjected to gastro-enterostomy," and further states, "if we take into consideration that here the development of carcinoma is observed only in 2 per cent. of all cases from a very large series of figures, we may, at least, conclude that the carcinomatous degeneration of a round gastric ulcer is of relatively rare occurrence." He also quotes Duplant as affirming that cancers may assume, by ulcerative disintegration, certain features of a primary ulcer,—may simulate "carcinoma ex ulcere." There is, at least, ground for belief that carcinomatous degeneration from simple ulcer, under proper medical treatment, is no more to be feared than where gastro-enterostomy has been done without excision. Williams,* (of Bristol, England, and Fellow of the Royal College of Surgeons) in his excellent and too little read treatise, says: "The cumulative weight of these diverse indications against there being, as a rule, any ætiological connexion between gastric ulcer and gastric cancer, is so overwhelming, as to be practically conclusive; although, of course, I do not mean to deny that cancer may exceptionally originate from gastric ulcer."

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* de Quervain: *Annals of Surgery*, p. 272, No. 2, August, 1914.

Syphilis of the stomach is uncommon. I have seen five cases diagnosed as syphilis of stomach, two of which were operated upon. I have also seen gastric symptoms of other patients, in whom the Wassermann test was positive, disappear under antiluetic treatment. Syphilis of the stomach is only a surgical condition when an occluded pylorus, or an hour-glass contraction, does not return to normal conditions under specific treatment. *The first clue* to this lesion is a history of infection confirmed by the Wassermann test and the *x*-ray; and second, the improvement of stomach symptoms which follows antiluetic treatment. We usually have absence of free HCl with blood in the stomach contents and stools; but, in one of my cases there was mid-normal free HCl. The *x*-ray is most valuable as a differentiative test. The pictures I have seen did not show the moth-eaten appearance of cancer, and there is much more extensive involvement of the stomach wall than in simple ulcer. In syphilitic ulcer there seems to be a strong tendency to the production of hour-glass; and, in connexion with this hour-glass variety, I have noted a characteristic point which differentiates it from cancer and simple ulcer: *In syphilitic hour-glass of the stomach we see a long regular isthmus at each end of which the walls of the stomach rise more or less abruptly or dumb-bell like.* This is in contrast to the sharp incision of simple ulcer hour-glass with practically no isthmus; and the picture differs quite as much from the cancer hour-glass with the infiltrated walls of the stomach sloping irregularly away from the constricted portion.* I have referred to this peculiarity on a number of occasions, but have seen no similar observation in the literature, and hope it may prove a differential sign of some value.

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* Williams: "The Natural History of Cancer," 1908, p. 280.

The following is an illustration of syphilitic ulcer of the stomach when the lesion has reached an advanced stage: August, 1913—A woman age forty, (referred for investigation by Dr. G. W. T. Farish, of Yarmouth, N.S.), had been suffering for about a year with great epigastric distress and pain immediately after eating; sometimes the pain would continue all day without intermission. From the beginning there had been vomiting, sometimes immediately after eating, and sometimes two or three hours later. The vomitus showed little change in the food eaten, no blood. Bowels constipated. There had been progressive loss of flesh, and as much as twenty pounds in the last three months. There was, a good deal of the time, a terrible feeling of epigastric pressure and weight and gnawing, especially when lying on her back. *Physical examination:* Patient tall and emaciated; colour good; tongue clean; no enlarged glands detected anywhere. Abdomen was retracted with epigastric tenderness and an irregular mass in mid-epigastric region which descended on inspiration. The picture was that of ulcer of the stomach. *Blood:* Hb. 80 per cent.; reds 5,488,000; whites 5,400. One hour following a *test breakfast,* only 6 c.c. or 7 c.c. of stomach contents was obtained, containing only a crumb or two of bread, blood, and no free HCl. *Microscopical examination* showed pus cells, atypical tissue cells and Oppler-Boas bacilli. The fæces showed occult blood with benzidin. The stomach findings caused me to change my first impressions and to consider the condition malignant and probably inoperable. The patient was anxious to take the smallest chance by exploratory operation, and this was done by Dr. Charles G. Mixter, of Boston. The stomach showed a diffuse thickening; no enlarged glands felt and the liver was smooth. The stomach was opened and explored; the wall was thickened and the mucous membrane eroded. (Dr.

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* The *x*-ray work of three cases, diagnosed as syphilitic ulcers, but not operated upon, was done by Dr. W. J. Dodd, of Boston. I am also much indebted to Dr. Dodd for the privilege of studying the plates of a fourth case at the Massachusetts General Hospital, and also to Dr. Charles L. Scudder for the courtesy of witnessing an exploratory operation on the same patient who had syphilitic hour-glass stomach.

Samuel J. Mixter who was present exclaimed, "it looks as though a rat had been scratching at it!") At the upper end of the stomach was a stricture-opening about the size of a lead pencil, rather diffuse. At the junction of upper and median third of the greater curvature is another stricture, apparently contraction of second ulcer. A partial gastrectomy was done removing one-third of the stomach, including the area involved in stricture and old ulcer. Cardiac portion brought down and sutured to lower portion of stomach. Inspection of the portion removed from the stomach showed the chief ulcer to be a serpiginous, shaggy ulceration which resembled no simple ulcer ever seen by any of those present, nor did it resemble cancer: syphilis was mentioned, but none present were familiar with this lesion in the stomach. Our present knowledge that free hydrochloric acid is absent (or usually so) in advanced syphilitic ulcer of the stomach is in itself practically confirmatory of this affection, because in simple ulcer we would, at least, have free HCl present, if not in excess. The patient made a fine recovery and improved generally.

A résumé of the pathological report by Dr. F. L. Burnett from the Pathological Laboratory, Massachusetts General Hospital, shows the following: "A mass of tissue representing about one-third of the cardiac end of the stomach. In the posterior wall there is a shaggy depression which has shaggy edges, and is dark red in colour. The tissue about it is firm. The section shows the tissue to be made up mostly of connective tissues which is thoroughly infiltrated with small round cells (lymphocytes). These cells show no particular arrangement. There are, also, a few homogeneous areas which evidently represent recent hæmorrhage. Then, too, there are places which show numerous blood vessels, and probably indicate a moderate degree of organization. There are, however, elsewhere, some vessels whose walls show a distinct thickening, and a few of which the lumen is entirely obliterated. The cells in themselves are for the most part connective tissue and lymphocytes; yet there are also a few leukocytes and endothelial cells, and occasionally a giant cell. There are no epithelial cells in the section. It is probably a simple ulcer but syphilis cannot be left out."

Following operation the patient improved in weight and strength and was soon eating soft solids. She was allowed to go home without a Wassermann test being made, and continued to improve for about two months when the old stomach syptoms reappeared. By the last of November she felt so badly and failed so much that she again consulted her physician who wrote that "she looked dreadfully and felt nearly as badly as before the operation." A blood specimen was taken and forwarded to Dr. William P. Boardman, of Boston, who reported the test strongly positive. It was not practicable to give the patient salvarsan at this time, but she was placed on the usual mercurial and potassium iodide treatment, and her stomach symptoms rapidly disappeared, and she gained in weight and strength. She came to Boston in 1912, and looked well and strong and well nourished. The Wassermann, however, was still strongly positive. She was given one salvarsan treatment and again given treatment of mercury and potassium iodide, but she refused further salvarsan injections. Since then, with this treatment, she has remained apparently well. (I regretted, exceedingly, that a Wassermann test had not been made at the time of the operation but this omission with the latter developments in the patient's case was further corroborative evidence of the luetic condition of the stomach. Had the patient been placed on specific treatment following the operation, this would not have been so evident). Unfortunately no *x*-ray was obtained in this case.*

A brief statement of the points I wish to make is this:

First: Physicians, by constantly training themselves to take and interpret histories, can detect a large majority of the stomach ulcers and cancers, and suspect many cancers in the early stages.

Second: Some physical examinations show nothing abnormal, though a grave lesion may be present in the stomach or other parts of the abdomen; but negative findings will decrease in proportion as the physician has trained himself to observe and has practised palpation and percussion. An elusive point in the physical examination may be the most important and deciding factor in the diagnosis.

Third: The simple laboratory tests are of great value: observances of the gross appearance of stomach contents; a test to determine the absence, deficiency or excess of free hydrochloric acid; one for occult blood in the stomach contents and fæces; and another for bile in the fæces:—all these data can be readily and quickly obtained by physicians in the remotest country districts. Such evidence, painstakingly acquired, ought to enable the physician to diagnose correctly the majority of all stomach troubles: A legion of mistakes have occurred because physicians have not used their judgement and knowledge, not usually from lack of these possessions.

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* A complete report of this and other cases will be made later.

Finally, when we cannot make a clear diagnosis by ordinary methods, we should employ every special aid available. The most important are the Wassermann test, including an examination of the spinal fluid, and examinations by the x-ray. The Wassermann test may, in certain ulcers and doubtful lesions of the stomach, be the means of deciding the proper treatment. Even when this test is negative, an examination of the spinal fluid with positive results may explain some puzzling attacks of epigastric pain,—as in unsuspected gastric crises,—and will, thereby, prevent unnecessary exploratory operations. The x-ray examination like every test in medicine is often inconclusive, and *it is not a short cut.*

A "PATRIOTIC medical bureau" has been organized by the physicians of Regina. The bureau will work in coöperation with the Patriotic Fund and will give medical assistance to all dependents of those who have gone to the front. Applications for assistance will be investigated by an attendant who has been appointed for this purpose, to whom all applications must be made. Patients will be sent to the office of one of the physicians attached to the bureau or to the out-patient department of the General Hospital. In cases of emergency or of serious illness, a physician will visit the patient. If a nurse is required, the patient will either be sent to the hospital or a nurse will be supplied by the Patriotic Fund; if assistance is required in the home, a woman will be sent by the same fund, and, if necessary, a housekeeper, who will be under the supervision of the visiting attendant will be sent to look after the family.

ANTI-TYPHOID INOCULATION

By Frank W. Schofield,

Bacteriologist, Provincial Board of Health, Ontario

MY object in reading this paper is to point out clearly some of the splendid opportunities for the application of anti-typhoid inoculation in civil life. Then later, by briefly quoting some of the results already obtained, I hope to accomplish the dual purpose of substantiating the claims made for it, and creating a wholesome confidence that will result in bringing this prophylactic into its proper place in preventive medicine.

Some may consider that an apology would be in order for writing on a subject so widely discussed and in some of its phases so well understood. But, unfortunately, many have refrained from realizing a practical experience with anti-typhoid vaccine; their knowledge of the subject being limited to a well memorized statistical statement of its value in the armies of the world. Therefore, I do not hesitate to bring before you some suggestions for its use in this province.

It may not be amiss to state briefly what is meant by anti-typhoid inoculation. This consists of injecting a definite number of dead typhoid bacilli into the subcutaneous tissue of the body, with the object of rendering the one so injected immune to typhoid fever.

A tremendous amount of evidence has been accumulated which proves beyond a doubt that this process does confer immunity from typhoid to an extraordinary degree. Major Russell of the United States Army has said that "Anti-typhoid inoculation protects against typhoid to a greater extent than does vaccinia against variola."

It may be worth while to refresh your memories with a few of the results obtained from its use in military life.

Quoting from the Anti-typhoid Committee's Report to the British Army, 1912, "The histories as regards typhoid fever, of 19,314 soldiers, whose average period of service abroad was twelve

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Paper read at Ontario Health Officers Association, Peterboro, Ont., May 12th, 1915.

months, were carefully followed and every precaution possible was taken to verify the diagnosis bacteriologically. Of the number 10,378 were inoculated, and 8,936 not inoculated. The case incidence of typhoid fever among the inoculated was 5·39 per thousand, and among the non-inoculated 30·4 per thousand. All of these men lived under identical conditions."

Reports from the French Army give the following figures. Among 30,325 vaccinated troops not a single case of typhoid occurred, although among the uninoculated the case rate was 2·22 per thousand amongst the home troops and 6·34 per thousand amongst the colonial troops. These men were serving under similar conditions.

At the beginning of the present war enteric was prevalent to a great extent among some of the German troops who had not been protected. Anti-typhoid vaccine was made compulsory with the result that typhoid was almost entirely stamped out.

According to a statement recently made in the British House of Commons only 421 cases of typhoid had developed in the British forces during this war, and of these, 305 had not been inoculated withing two years, therefore they could not be considered as being immunized. Only one death occurred among the 116 men who had been recently inoculated, while among the 305 unprotected there were 35 deaths.

Such results are really wonderful, especially when we remember the awful loss of life from typhoid that occurred during the Spanish-American War and the Boer War of 1900. During the latter war there were 8,200 deaths from typhoid while only 7,772 men were killed in action or died from wounds. If such brilliant results can be obtained when used in military life, what are its possibilities among civil communities? Let me emphatically say that the results have been and will continue to be equally satisfactory.

The advisability of extending typhoid vaccination to communities at large while not being harmful is unnecessary unless, owing to a breakdown in the public health machinery, an epidemic of typhoid is threatened. But there are certain individuals and groups of individuals that owing to the nature of their work and the conditions under which they work, are peculiarly exposed to typhoid infection.

First, let us consider the hospital nurse. The attack rate of typhoid fever among nurses has been calculated to be from eight to twenty times as great as among the civilians living in the same community. In other words, the hospital nurse is from eight to twenty times more liable to contract typhoid than the ordinary civilian. One would have expected a much higher attack rate than this, such figures show clearly the value of careful training in preventing the spread of a contagious disease. By the use of vaccine the typhoid rate can be reduced at least 75 per cent. Inoculation should be made compulsory in all general hospitals. One complete treatment will protect the nurses during their whole course.

Naturally the chances of the physician in general practice of contracting typhoid are greater than those of the ordinary civilian. As an example as well as a safeguard he should be protected in this way.

The inmates of asylums and other institutions can be similarly protected. Anti-typhoid inoculation has frequently proven of tremendous value in preventing serious outbreaks in such places.

We occasionally get reports of serious outbreaks of typhoid in lumber and construction camps. This would never be the case if the labourers were inoculated. Good sanitation is very necessary and will of course, help greatly in preventing this disease here as elsewhere, but cases will crop up in spite of the best sanitary arrangements. The danger of typhoid can be practically eliminated if complete inoculation of the men is enforced.

Anti-typhoid inoculation in the home. Every physician should realize the importance of his duty in this respect. When a case of typhoid fever has been discovered in a home, the inmates should be inoculated as soon as possible. How truly miraculous it is that so many householders escape infection when not given this protection, and how deplorable and unnecessary it is that any secondary cases develop.

The treatment is not absolute, but is quite equal in value to any other prophylactic inoculation existing.

How frequently the answer "contracted at home while nursing mother, brother or sister who is suffering from typhoid" is given in answer to the question "where contracted?" Such an answer is quite out of place in these days of preventive medicine. The physician should be considered responsible for secondary cases if those exposed were not advised to take the preventive treatment.

To refrain from giving or at least advising a prophylactic dose of diphtheria antitoxin to the members of a family who are exposed to diphtheria would be considered a very serious omission. Why not then, use typhoid vaccine after exposure to typhoid which is quite as effective? Moreover, the vaccine is supplied absolutely free, while the antitoxin does cost a few cents.

Large communities such as cities, towns and villages should receive like protection when threatened with an epidemic. The inhabitants should be advised in every possible way to take advantage of this free prophylactic treatment, if the situation is at all serious. This, I may say, has been done here and elsewhere with great success.

The most important fields of usefulness for anti-typhoid vaccine having been covered, I will, by briefly citing some of the results obtained, endeavour to convince you that its efficacy has not been exaggerated.

Our first experience with the vaccine was in a northern lumber camp. Within a few days 18 cases of typhoid had occurred; the physician in charge became alarmed and left. The sanitary conditions were almost as bad as they could possibly be. The entire camp with the exception of the sick men were inoculated; no further cases developed.

Last year, the physician in charge of several lumber camps made a strong appeal to the men to be protected against typhoid by submitting to inoculation. Out of about 880 men 640 were inoculated; in this group no cases developed. Among the 240 uninoculated men 13 cases developed.

Another physician states that last year was the first in ten years that the camp under his supervision has been free from typhoid. He considers this was the result of anti-typhoid inoculation. Many more cases could be mentioned where equally good results have been obtained.

Unfortunately, we have but meagre records of its use in families where one or more of the members have been attacked with typhoid fever. I hope that before long this statement will be changed. Allow me to quote from one report, "The vaccine was used in five different families, sixteen people being inoculated. In some of these families case followed case until the vaccine was used, after which no further cases appeared." The people were very dirty and poor, everything contributing to the spread of infection. All the reports received have been quite satisfactory, in that no cases have developed after immunization. The nurses and attendants of several provincial hospitals have been inoculated with the usual good results. Most of the nurses in the larger Toronto hospitals have been protected. One or two genuine cases of typhoid have developed subsequent to the inoculation. This is to be expected, no method of prophylactic inoculation in existence is infallible.

The nursing staff in these hospitals has never before been so free from typhoid.

In six Massachusetts hospitals where careful records of the typhoid fever rate among the nurses had been kept, it was found that 5 per cent. of these nurses contracted typhoid. Voluntary inoculation was introduced. As a result no cases occurred among the inoculated nurses, but during the same period among the uninoculated 8·5 per cent. contracted typhoid.

In regard to its use during epidemics in towns and cities, the case of Ottawa might be mentioned. During that severe epidemic a few years ago, several hundreds of the citizens were inoculated with, I believe, very satisfactory results.

Recently, during the outbreak, at Brockville, 500 citizens out of about 9,000 were inoculated while the epidemic was at its height. Of these none contracted typhoid after the inoculations were completed. One case developed between first and second injections. As in other such instances, the disease was mild. It is only reasonable to suppose that some of the 500 were infected at the time the vaccine was administered, and that the disease in them was aborted.

The advisability of giving inoculations during the course of an epidemic has been questioned by those who pessimistically ponder over the "negative phase." Theoretically it may be reasoned that it is dangerous, but practically as far as our results show, it is absolutely safe. During the last three years the Provincial Board of Health has distributed to the physicians of the province about 8,000 doses. At present, we have not received any unfavourable reports. Records of 2,000 inoculations have been received and in no cases have those completely immunized developed typhoid. It should be remembered that many of these have been exposed to serious infection.

Three cases of typhoid have developed during the period of inoculation. Two were attacked between the first and second injections, the other came down a day or two after the second injection. In these cases the disease was very mild.

I will burden you no longer with case reports, but before concluding I desire to emphasize briefly a few important points to be observed in giving the vaccine.

Never give the vaccine to a person who is fatigued.

It is very important that the immunized should do no physical work after receiving the injections. The more strictly one rests the less the discomfort caused by the reaction.

Advise strongly against the use of alcohol either immediately before or after the injections. The reaction is always more severe in alcoholics.

The most suitable place to make the injections is the outside of the arm near the insertion of the deltoid. Make the injections into the subcutaneous tissue. Another favourable location is the infra-clavicula space.

Following inoculation some degree of malaise may be expected in every case. Also a certain amount of local swelling and redness will occur,—the local reaction. This is quite transient, passing away within twenty-four to forty-eight hours.

Keep the vaccine in a cool dark place.

Always shake well before using as the suspended bacteria settle quickly.

If it is desired to minimize the immediate effects of the vaccine the initial dose may be reduced to 250 mill. followed at eight to ten days intervals with 500 mill. and 1 billion.

Further information can be obtained from the leaflet on the subject issued by the Provincial Board of Health.

Some, I know, will object to this paper and say the problem is being attacked at the wrong end. What we need is more attention to the obtaining of pure water, safe milk, the proper disposal of sewage and the extermination of flies. Exactly, but will this entirely prevent the menace of typhoid carriers and convalescents who come among us? When the tubercular cow has vanished and healthy people no longer carry diphtheria bacilli in their throats, and typhoid baccilli in their intestine, then we can abandon the pasteurization of milk and the use of anti-typhoid vaccine. But until then, both of these preventive measures must be brought into operation as widely as possible for the protection of humanity.

THE editors of the *Revue de Médecine* and the *Revue de Chirurgie* announce their intention of resuming the publication of these two periodicals, which has been suspended since August, 1914. Particular attention will be paid to experiences in medicine and surgery during the present war, and the editors will be glad to receive communications from members of the profession who are or have been at the front. The address of the editors is 108 Boulevard Saint-Germain, Paris.

INFLUENZA MENINGITIS WITH REPORT OF TWO CASES

By Alan Brown, M.B.

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THE extension of the practice of employing lumbar puncture as an aid to the diagnosis of meningitis has had as one effect the establishment of the important fact that the influenza bacillus is not an infrequent cause of sero-purulent meningitis. That the influenza bacillus may act as a cause of acute inflammation to the meninges has been known since the publication of Pfuhl's illustrative case in 1892, but that it acts as a not infrequent cause of that condition we are just beginning to learn. Influenza meningitis appears to be a very severe and fatal form of meningitis and to be exceeded in respect to its fatality only by the pneumococcus and tuberculous forms. It remains, however, for the present an undecided question whether influenza bacilli may not occur in the cerebro-spinal fluid without setting up inflammation just as pneumococci and some other organisms have been known to do. The frequency with which the influenza baccilli occur in the cerebro-spinal fluid in all conditions has not been determined. The influenza bacillus is a slender rod somewhat varying in size, staining deeply at the poles and being gram-negative. Its invariable and most prominent characteristic is its hæmophilic property, next to which pleomorphism is its most striking attribute. It may be considered as conclusive that a pseudo-influenza bacillus, as distinct from the true influenza bacillus producing pathological conditions in human beings, does not exist. In the Infants' Department of the Children's Hospital cultures are made exclusively on agar mixed with rabbit's or human blood. Petrie plates and slanted tubes of the medium are readily prepared by adding a few drops of rabbit's blood to the melted agar previously cooled to 45°.

The pleomorphism of the bacilli is brought out clearly by observing cultures from day to day. After growing from fifteen

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From The Infants' Department and Laboratory of The Hospital for Sick Children, Toronto. Received for publication September 21st, 1915.

to twenty-four hours minute regular bacilli among which threads are present are seen, on the second day the curved forms and threads are usually increased and the bacilli are thicker. As regards the pathogenicity of the bacillus, all the strains studied by Wollstein[1] were virulent for the smaller animals. Agglutination reactions, complement deviation tests, and protection experiments made by this same observer are inconclusive. It is interesting to note here that in every respiratory case admitted to the department a culture is taken from the bronchial secretion and examined for the various pathogenic organisms. During the fall and winter of 1914-15 we found one-third of the cultures to show the presence of the influenza organism. Since 1903 the number of cases of meningitis due to the influenza bacillus has been increasing, this point is undoubtedly explained by the imperfect pathological methods originally employed. The frequent finding of the influenza bacillus in cases of endocarditis, purulent arthritis, empyema, appendicitis, peritonitis, meningitis, and otitis, as well as their frequent occurrence in the bronchial and nasopharyngeal secretions in cases of clinical influenza indicates that this organism, like the pneumococcus, is capable of causing inflammations of the serous membranes anywhere in the body. A few words should be added on the probable mode of infection of the meninges with the influenza bacillus. It is a well-known fact that the influenza organism is present in the nasopharynx in a high percentage of persons exposed to influenza.

The upper respiratory tract would appear to the most frequent portal of entrance into the body for these organisms and to account for their frequent localization in the middle ear, bronchi and lungs; whether the meninges are infected directly through the lymphatic connexions existing between them and the upper nasal mucosa must, for the present, remain an undecided question. It is of some significance to learn that after subdural inoculation of the bacilli the organisms can be recovered from the upper nasal mucosa, suggesting that they are, in part, excreted there. It must, however, be considered that since they also reach the blood they may be secreted from the blood and not directly from the meninges, or that they are contained in the blood in the peripheral circulation, and that a slight injury of the mucosa inseparable from the making of the cultures is responsible for their presence in the tubes. The following case was referred to me by Dr. Andrew Gordon.

Case 1. D. J., age five months, admitted with a history of coryza, fever and convulsions of four days' duration; the convulsions having commenced but forty-eight hours before entering the hospital. The family physician was called on account of "cold and bronchitis". Two days later the mother noticed retraction of the head, in addition to this, a slight intestinal upset. The child was well developed and nourished, fontanelle bulging, slight retraction of the head, increased tendon reflexes, irregular respirations and general spasticity. Chest clear. Fundi showed an intense double papillitis. Double aural paracentesis revealed pus in both ears from which smears and cultures showed almost pure influenza. There was a leucocytosis of 38,000 with 71 per cent. polymorphonuclears. Temperature range between 99°F. and 104°F.

SPINAL FLUID—CASE 1.

Date	Amount	Characteristics	Cell Ct.	Differential Ct.	Globulin	Smear and Culture
Feb. 8th.	25 c.c. + pressure.	Yellow, faintly turbid.	1600	96 per cent. polymorph.	xxx	Influenza bacilli extra cellular.
Feb. 9th.	77 c.c. + pressure.	More turbid.	3400	100 per cent. polymorph.	xxxx	do.
Feb. 10th.	35 c.c. + pressure.	Turbid.	3600	do.	xxxx	Bacilli becoming intra cellular.

On the 9th and 10th, 18 c.c. and 30 c.c. of influenzal serum were injected by the gravity method intraspinally; apparently the only benefit obtained from the serum being the increase in phagocytosis. The infant was almost moribund on admission and died in seventy-two hours. The blood culture obtained during life showed a pure growth of influenza. Cultures from the post-nasal space and from the pus obtained on paracentesis showed a profuse growth of influenza. A culture procured from the bronchial secretion did not reveal any influenza bacilli. Autopsy showed an extensive leptomeningitis, the exudate being thickest at the base, fatty infiltration of the liver, exudative nephritis and a very small superficial strip of bronchopneumonia at the left base. Post mortem cultures from the brain, heart's blood, left lung and mastoid showed pure influenza. The points of interest in this case are (a) path of infection, apparently through the ethmoidal plate with practically no involvement of the lungs; (b) the effect of the serum. This of course was not encouraging, although on the second day following injection, there was marked phagocytosis.

Case 2. J. H., age one year, admitted to the Infants' Department, June 7th, and died four hours later. The child had had a cough for a period of two weeks and acute symptoms of fever, drowsiness and convulsions of but two days' duration. Examination revealed the child in a comatose and dying condition, the chest was filled with many coarse râles, constant nystagmus, generalized convulsive movements, fontanelle bulging and Brudzinski's sign strongly positive. Temperature 99°F., lumbar puncture revealed 35 c.c. slightly turbid fluid under increased pressure, cell count 6,080, 73 per cent. polymorphonuclears, globulin xxx. Smear showed many gram-negative bacilli mostly extra-cellular. Cultures from the sputum and blood negative for Pfeiffer's bacillus. Autopsy showed a purulent leptomeningitis, convolutions covered with thick exudate spilling over into the sulci. Small amount of exudate at the base extending on to the ethmoidal plate and involving the optic nerves and chiasma. The lungs showed no pneumonia, only a small amount of congestion posteriorly. Through some error post mortem cultures were not made.

Remarks

That the influenza bacillus produces a purulent meningitis in numerous instances there is no doubt and furthermore this organism in many cases both experimentally and clinically produces a septicæmia, and involvement of the serous cavities. In Wollstein's[1] experimental work on guinea pigs and monkeys all the strains were obtained from definite clinical cases of influenzal meningitis either pulmonary infection alone or a combination of lung and meningeal infection. Cohen[2] believes that most of the cases of influenzal meningitis reported have been those of so-called organisms of septicæmic meningitis infection caused by bacilli closely allied to that of the influenza organism, the only difference being that the latter is not found in the circulating blood while the former is characterized by its constant presence. Further work by this observer in conjunction with Fitzgerald[3] attempted to show that the bacillus of septicæmic cerebro-spinal meningitis has in the past been confused with the Pfeiffer organism. Both infections being highly fatal and the distinguishing feature being the reaction of agglutination. All other observers with the exception of Odaira[4] differ from Cohen and Fitzgerald. Wollstein's work seems most confirmatory, in conjunction with the large amount of clinical evidence at her disposal.

The frequency with which the influenza is present in the various respiratory infections may be gleaned from the fact that in one season Holt[5] obtained 63 per cent. positive cultures. As previously mentioned during the winter and fall of 1914 and 1915 in the Infants' Department at the Sick Children's Hospital an investigation showed that 31 per cent. of the infants had the influenza present in the bronchial secretion. From these facts alone it is no wonder that a meningeal involvement is not infrequent.

The character of the spinal fluid of influenza meningitis is fairly uniform. On withdrawal, it is cloudy and deposits on standing a whitish or yellowish sediment, as the disease progresses the fluid becomes more purulent. Polymorphonuclears are increased, the globulin content positive and reducing substances negative. The bacilli are seen usually free in the field and there is very slight phagocytosis until after the serum is used. The morphology of the bacilli vary greatly. It is doubtful whether the bacilli are ever present in a clear fluid. The great preponderance of cases of influenza meningitis among young infants and its very high mortality are very striking as is the opportunity which lumbar puncture gives for early and correct differential diagnosis in this disease. Thus, since Slawyk's[6] positive case in 1899 there have been slightly over fifty cases of pure influenzal meningitis reported. In addition to this there are nine cases of mixed influenzal infection, five of which complicated a tuberculous meningitis; in all there are but six reported to have recovered, one following the use of the influenzal serum.

Literature:

1. Wollstein, *Am. Jour. Dis. Child.*, 1911, vol. i, pp. 26-58.
2. Cohen, *Annales de l'Institut Pasteur*, 1909.
3. Cohen and Fitzgerald, *Central F. Bakt. Orig.*, 1910.
4. Odaira, *Central F. Bakt. Orig.*, 1911, 61, p. 289.
5. Holt, *Arch. Int. Med.*, 1910, vol. v, pp. 449-458.
6. Slawyk, *Ztschr. f. Hyg.*, 1899, xxxii, 443.

The Canadians resident at Folkestone, England, have offered to supply a convalescent hospital for Canadian soldiers. The offer has been accepted by Colonel Rennie, the director of medical services, and will take the form of a unit with accommodation for fifty patients.

Case Reports

CHOLELITHIASIS AND CHRONIC VALVULAR DISEASE

BY E. M. VON EBERTS, M D.

Surgeon to the Montreal General Hospital

WITHIN the last few years several articles have been published upon the subject of chronic cholecystitis as a cause of myocardial incompetence, notably a paper by Robert H. Babcock, of Chicago, in which the histories of thirteen cases are recorded. It would appear to be the opinion of these writers that the myocardium suffers as the result of (1) the circulation in the blood of bacteria or their toxins; (2) the depressing influence of bile constituents on the myocardium; (3) disturbance of the splanchnic circulation and (secondarily) of the systemic circulation and the heart; and (4) reflex inhibition through irritation of the vagus.

The following case is reported in the belief that it demonstrates the possibility of the heart being the primary factor, and the cholecystitis and cholelithiasis secondary, for the reason that chronic congestion of the liver must necessarily embrace a catarrhal condition of the biliary passages, with a special susceptibility to infection. The lithiasis is secondary to the cystitis.

L. McL., female, aged twenty-seven, was referred to the Montreal General Hospital on May 8th, 1914, by Dr. Robert Elder, of Granby, Quebec.

The patient's general health had always been good, although she was a "blue baby", and there had always been evidence of organic heart disease.

In April, 1912, the patient had an attack of severe pain in the lower portion of the abdomen, accompanied by vomiting. The bowels were constipated. There was a slight rise in temperature on the first day of the illness. There was no jaundice. A tender point developed above the level of and to the right of the umbilicus. The patient was confined to bed for one week. Two weeks later a second attack, with pain in the epigastrium, occurred. The pain was less severe than in the first attack, but the vomiting was fre-

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quent. The same tender point was noted. Twenty-four hours after the onset of the attack jaundice developed, and persisted for two weeks, during which time the patient was confined to bed. After a lapse of a fortnight a third attack occurred, with the same symptoms: pain, tender point, vomiting, and jaundice. The patient was confined to bed for five days. In this attack Dr. Elder noted that the liver dulness extended as low as the umbilicus. For about ten months subsequently, or until April 9th, 1914, there were no symptoms. On this latter date there was a recurrence of all the former symptoms with the exception of the jaundice. The patient was in bed for five days. The fifth and last attack began on May 5th, 1914. Severe pain was at first absent, but there was tenderness in the right upper quadrant. Vomiting occurred six or seven times during the day. On the 6th the patient vomited only once. There was no fever. On May 7th the pain became suddenly very severe, and vomiting occurred twice during the day. A mass at the level of and to the right of the umbilicus was detected for the first time. On the morning of the 8th the symptoms were more aggravated. A swelling in the region of the gall bladder was distinctly visible. The temperature was 101°; and the pulse, 120.

The patient was admitted on the evening of May 8th. Examination then showed the following condition. Temperature 100-4/5°; pulse, 160. In the right side of the abdomen, reaching from the middle line to the outer border of the rectus, there was a tender, palpable mass, extending from the costal margin to a point 3 cm. below the umbilicus. Over this area the abdominal muscles were rigid. There was a slight increase in the transverse dulness of the heart. At the base of the heart there was a loud blowing murmur, apparently systolic in rhythm, heard less distinctly at the apex and not transmitted to the axilla. The leucocytosis was 28,000.

Operation was performed at 10 p.m. After a preliminary hypodermic injection of morphine gr. 1/4 and atropine gr. 1/150, anæsthesia was induced and maintained by ether (open method). An incision five inches long was made one centimetre within the border of the right rectus muscle, extending from just below the costal margin to the umbilicus. The deeper layers of the parietes were œdematous. The peritoneal cavity contained a moderate amount of blood-stained fluid. There was exposed a distended and acutely inflamed gall bladder, almost wholly invested by omentum. The recent omental adhesions were separated, and the tense gall bladder tilted forward into the wound. The distal portion was greyish and gangrenous, and the walls were greatly thickened throughout. A quantity of purulent material was aspirated. The gall bladder was then drawn as far forward as possible into the upper angle of the wound, and stitched to the peritoneal edges of the incision. The lower portion of the wound was closed in the usual way. The protruding portion of the gall bladder was then excised, the interior sponged out, and an irregular calculus, about the size of the terminal phalanx of the little finger, removed. No other stones could be felt. Drainage was provided.

Toward the latter part of the operation a submammary saline was given.

When the patient was removed to the ward, the pulse was very small, 160 to 170. A continuous rectal saline was ordered.

During the morning of the 9th the patient vomited once. The temperature was 99-2/5°; the pulse varied between 112 and 120. The expression was normal, and the patient appeared to be convalescent.

On May 10th, Dr. Gordon Campbell reported the heart lesion to be a pulmonary stenosis. When the patient had sufficiently recovered, electro-cardiographic observations were made by Dr. Cotton, who confirmed the clinical diagnosis of pulmonary stenosis.

As a heart lesion had been present since birth, there can be no doubt that the cholecystitis and cholelithiasis were of a later development.

THE McLaughlin Carriage Company and its employees have presented three motor ambulances to the Canadian Red Cross Society. Each ambulance is of new design and will accommodate four patients lying down or twelve sitting patients. Other ambulances of the same design have been presented to the society by the Ottawa and Ottawa Valley Branches of the Red Cross Society, by the staff of the Bank of British North America, and by the Sudbury District Branch of the Red Cross Society.

Editorial

TRANSFUSION

THE medical profession is witnessing a new wave of enthusiasm over transfusion. When we remember that for several centuries the usage of phlebotomy had become obsolete, only to be recently revived, it ought not to generate surprise that transfusion has undergone a similar course.

This method of treatment by the injection of a healthy individual's blood into a patient has been in vogue for many centuries, but through the disasters that occurred by reason of its irrational employment, its usage was prohibited by the Government of France in the seventeenth century. Folli had used it in 1654; Denis in 1667; and Cronne and Lower in the same century had employed it with the blood of lower animals and the human, with more or less success.

A century ago it was again revived, being chiefly used to replenish blood-losses after labour, and in many instances blood taken from the lower animals was used with impunity. Blood was carried directly from the donor to the recipient, or was removed from the body, defibrinated, and thus injected into the patient.

Our studies of hæmatology and immunity have led to the important observation that blood of different species often varies to such an extent as to render indiscriminate transfusion of great danger to the recipient and that in the human, moreover, the variations were such that without previous tests for the compatibility of the blood of recipient and donor, it was impossible to tell whether safety could be assured.

There have been various opinions as to why transfusion should be beneficial, and in the estimation of many the mere volume of blood explained the improvement. For this reason it was held that the use of transfusion had no advantage over the intravenous injections of saline solutions. But here again modern hæmatology has demonstrated that blood formation is stimulated by the introduction of new blood, so that transfusion has obtained an added importance. After all, the object of transfusion is to attain a safe, rapid and simple mode of restoring the volume of blood, but more especially its regeneration in the blood-forming organs. Intravenous saline injections, however, are useful only where the organs are already in good condition and can withstand the immediate and violent stimulation of a large volume of fluid. The *object* of transfusion, then, is to provide those morphological elements and active principles from the donor which can improve the impaired metabolism of the recipient and stimulate his cells and hæmopoietic organs. This is all transfusion is expected to accomplish, for it neither rejuvenates old organs, nor repairs diseased tissues, though it affords them time to regain their loss and to add a stimulus to their new growth.

One must bear in mind, however, that transfusion is no panacea, and that we should therefore avoid too great enthusiasm about its employment, though when properly used, and in suitable cases, it may be of the greatest benefit.

With the improvement in modern surgery and the advantages of asepsis, the manipulation of blood vessels in skilled hands has become a comparatively simple matter, and to-day, thanks to the genius of Carrel and Crile, the renewed appreciation of transfusion has gained ground. If to-day appeal is seldom made to their methods, (artery to vein transfusion), on the other hand we are indebted to their zeal for making it more obvious that transfusion is not only a benefit where much loss of blood has occurred, but in many other ways it operates both as a life-saver and a healer of disease.

It must not be supposed from the above remarks that the transfusion from the donor's arteries to the veins of the recipient is by any means an obsolete method, for during the present crisis in France, the surgeons are employing this method with success,—witness the brilliant results of Berard and Lumière in September last. There is no doubt, however, that surgical skill and well practised technique are essential to the successful employment of artery to vein transfusion and the indirect method of collecting blood from the donor's veins with citrate solutions and in paraffin tubes, prior to the injection, can easily be employed with very little apparatus, with comparatively little skill, and much more expeditiously.

The technique of transfusion has been the subject of discussion for the last decade, and very few journals are issued which do not contain some article dealing with the subject.

Since the profession at large have begun to favour its employment, many methods have been invented to replace the more difficult and dangerous technique of Carrel and Crile. Lindeman, for example, was among the first to use the vein to vein transfusion in a large series of cases, though v. Ziemssen too, had used it twenty years earlier. The blood is withdrawn by syringes from the veins of the donor, and injected seriatim into the recipient. But this method was found rather complex The need of many assistants and the too much and too frequent handling of the cannulæ resulted in jarring, in trauma, and in over-frequent clotting of the blood. Though his results were remarkable, they should be attributed to his individual skill rather than to the method he employed. It was necessary, if possible, to gain some method by which trauma to the vessels and unnecessary clotting could be avoided, so that a large amount of blood could be taken from the donor at one time. This has been successfully accomplished within the last few years, both by the direct and indirect method. Perhaps the greatest achievement is the invention of Unger, who uses the direct method. A short needle attached to a rubber tube is placed in each of the veins, of the recipient and donor. These two tubes are severally attached to a double-way stop-cock which, connected with a syringe alternately withdraws blood from the donor, and then supplies it to the recipient. At the same time there is another syringe attached to the stop-cock which alternately supplies saline to each. When a syringe full of blood has been withdrawn, the stop-cock is turned thus allowing the blood to be injected into the recipient, while the saline at the same time is made to flow into the tube connected with the donor. In this way both channels are constantly suffused with blood or saline, as the case may be, and clotting is easily prevented. The apparatus is previously washed with a thin solution of paraffin, which further inhibits the clotting. Recently Unger has even dispensed with the paraffin as being unnecessary.

60 c.c. of blood can be transfused per minute,—the method is rapid, the speed may be controlled, and the blood is kept outside of the body for a minimum of time, so that clotting is in every way prevented. Unless the patient is very stout, or the veins very small, there is no need to expose them, as the needles may be inserted with ease directly into the veins through the skin.

Another remarkable device (an indirect method), has been perfected in various ways by Kimpton and by Weil.

Kimpton's method consists in the use of large paraffin-coated glass cylinders (250 cm.) with an exaggerated S-curve at one extremity which is drawn to a fine point allowing of its insertion into the vein. The blood is collected from the donor's vein and subsequently expelled into the recipient's vein by means of a rubber bulb. The paraffin coating delays coagulation, and allows a reasonable interval to elapse before the blood is injected. The disadvantage of this method, however, is obvious. It is not always easy to withdraw the blood in this way from the donor's veins, and later even when the tube has successfully been filled, any accidental clotting at the point of the tube would render useless the large quantity of blood withdrawn.

Herudin, which is an active principle from the buccal gland of the pond leech, is sometimes used instead of paraffin to minimize the danger of coagulation. The method was devised by Satterlee and Hooker, but Lewisohn's experience indicates that its employment is dangerous. Its anti-coagulant action is attributed to its power to effect balance between the pro-thrombin and anti-thrombin, or at all events to neutralize the thrombin and the pro-thrombin.

The indirect method of transfusion by means of sodium citrate as an anti-coagulant was devised by Hustin, and elaborated by Lewisohn. Here as in Kimpton's method the blood is withdrawn by means of a cannula into a large cylinder or jar containing 5 c.c. of a 10 per cent. sterilized sodium citrate solution, and the fluid thus collected is stirred while running. The sodium citrate fixes the calcium of the blood which is a necessary factor in spontaneous coagulation, i.e., it induces decalcification.

Lewisohn found that a 2 per cent. solution would retard coagulation for forty-eight hours. After withdrawing 250 c.c. of blood and mixing it well with a glass rod, more citrate solution is added for larger quantities of blood, thereby insuring fluidity. It is interesting to note that the citrate solutions do not have any effect in retarding the coagulation time in the recipient. On the contrary, it has been observed, and confirmed by Weil that the coagulation time is hastened, an experience which is of importance in considering the treatment of purpura. Some operators have thought that the chemical reaction resulting from decalcification might induce toxicity, but this was not Lewisohn's experience. He injected large quantities of blood by this method with impunity and found no toxic results.

One other method of indirect transfusion is worthy of mention, namely, by *defibrination* By this method the blood having been withdrawn from the donor is deprived of its fibrin through stirring and thus injected into the recipient. There is no doubt that in the past many successful transfusions have been made by these means, despite its present unpopularity. Those who are opposed to this method hold that as the fibrinogen and platelets are removed and the cells injured, much of the value of this method is lost. Possibly the patient's anti-thrombin may not be sufficient to counteract the effect of the thrombin in the defibrinated blood, and intravascular clots may result.

Of the *dangers* of transfusion much has been written. Blood is a complex tissue and the change in its quality and quantity are numerous under many conditions. The ideal to be attained is to give to the receiver a blood which is both acceptable and potent, and so to modify the donor's blood as to attain this end. The incompatibility presents one of the greatest dangers, particularly from hæmolysis, though it has been questioned whether or not this danger is overestimated. Considering the amount of transfusion done, and the frequent disregard of this danger, it may be said that disastrous results are few. It should be remembered that from small causes, the donor's blood previously compatible, may easily be rendered incompatible, as, for example, by the taking of alcohol. Further, that blood may not hæmolyse in vitro, but may do so in the circulation, and vice-versa.

It was Bernheim's impression that where urgency was required, it was not worth while attempting the test for hæmolysis, and more recently Berard, who, during the present war has employed transfusion with and without the hæmolysis tests for a large series of cases in which clots, infection, pyrexia, and other serious conditions were present, not a single instance of trouble from this source was observed. It is, of course, of great importance during the operation to avoid the admixture of any thrombo-plastin from wounded tissue of the donor's vessels, as well as from the thrombo-plastin which might be derived from the cells of the blood through friction during the transfer.

Notwithstanding the recorded successes in this field, it must never be forgotten that one is constantly confronted with this danger, and that a hæmolysis may occur and has indeed occurred with hæmoglobinuria and other serious symptoms. For this reason one is not justified in omitting the tests, where time permits.

The danger from air embolism seems equally exaggerated; at all events air purposely introduced into the veins of lower animals, during experimental transfusion, produced no serious results.

Dilatation of the heart as a result of transfusion is an easily avoidable consequence, when any of the modern methods is employed. By any of the means above mentioned, the quantity of blood and the speed of its transfer can be easily regulated to suit the requirements of the participant.

The *indications* for transfusion are many. As an emergency to save life it is employed both because of its power to replace the lost liquid resulting from hæmorrhage in a large vessel, and its hæmostatic action in stopping persistent oozings. In such emergencies if the patient be young and strong, it is well to use saline injections first, and transfuse later.

In grave anæmias of unknown origin, transfusion has been used with great effect. In the other blood diseases, particularly in the purpuras and hæmophilia, good results have been obtained. The human blood as a therapeutic agent appears to have an advantage over the serum of animals, because blood cells which are transfused go on living and functionating. In purpura definite cures have been attained. In hæmophilia, transfusion supplies the pro-thrombin and therefore stops the bleeding, and at the same time replaces lost blood. In pernicious anæmia it has apparently done no more than prolong the periods of remissions. No authentic cures of pernicious anæmia have as yet been recorded by transfusion, though much unpublished data announcing success may still be forthcoming.

For surgical conditions, either prior to or during operation transfusion aids anæsthesia, it repairs the resisting power, thus preventing shock and other subsequent serious reactions, and converts a poor surgical risk into a good one.

Transfusion is indicated if the hæmoglobin is less than 50 per cent., if the patient will be unable to take much food soon after the operation; and again if the operation is likely to be a lengthy and bloody one.

Reverting to our original statement to the effect that transfusion has with reason been revived, we may confidently anticipate that with the years there will be an ever-increasing employment of this method, and that when blood conditions are still better understood, the facilities for doing this work will be greatly augmented.

THE ONTARIO COMMISSION

WE desire to call the attention of the profession throughout Canada to the Special Commission appointed by Premier Whitney, of Ontario, to investigate and study carefully all the various medical cults now desiring the right to treat the sick, and applying to the Ontario Legislation for official recognition. A report to the government of the information thus obtained will be made, and a decision arrived at in regard to each cult as to the necessity or desirability of any official recognition of its claims, thus implying the right to treat disease, and to sign death certificates.

Two years ago, Premier Whitney, in his address at the opening of the new Toronto General Hospital, made the promise to appoint such a commission to settle, so far as may be practicable, the status of the many schools of medical thought which have sprung up during the past few years, and in fulfilment of this promise Justice Hodgins of the Supreme Court of Ontario has recently been appointed as the Commissioner. During the past few weeks, chiropractics and osteopaths, Christian Scientists, drugless physicians, and monotherapeutists, optometrists and opticians, have all been represented, and have presented their claims. As the Court stated at its opening, every school of medical thought will be heard and considered. There will be no controversy. All medical cults will have a chance to tell all they know about the manner of treating disease, and the advantages to be derived from their special method. Regular medicine has also been obliged to present its *apologia pro sua vita.* Our old friends the Medical Faculty of the University of Toronto, the Ontario Medical Association, the Ontario College of Physicians and Surgeons, the Provincial Board of Health, the Ontario College of Dental Surgery, are all to appear and present their statements. We publish in this number the statement as presented by the President of the Ontario Medical Association, regarding its history, the reason for its existence, and the good work which has been accomplished under its auspices during the half century that it has existed. This statement should be read by all.

That there are many men of many minds, and that all men do not think alike are platitudes which have their demonstration in every profession, and in none more so than in our own. Very justly Dr. Cameron makes the claim that the profession in Ontario (we may add and in the Dominion) cannot be considered a close corporation. Its doors have always been and are now open for the admission of any one who can comply with the common regulations regarding education and training. We do demand, however, in the interests of the general public that no person be recognized by the authorities of any province as a fit and proper person to treat the sick in any way or to any extent who has not obtained by years of previous study a good working knowledge of the basic facts of chemistry, biology, anatomy, physiology, and bacteriology as tested by an examining board competent to examine, before whom all students desiring to practise medicine must pass. We are confident that no government in Ontario will be so defiant of the intelligent public opinion as to open wide the portals, and permit ignorant brazen-faced charlatans to do much harm by their mischievous efforts to treat disease of which they know not the cause, or the course it may run, or the end which is threatening.

A NUMBER of convalescent homes intended exclusively for Canadians have been opened in England. During the summer months, such convalescents were sent to Bromley Park, Woodcote Park, Epsom, and to the larger hospital at Monks Horton, near Shorncliffe; now, however, that the weather is too cold for tent life, other convalescent homes have been opened, among them, Hillington House, Uxbridge, which is used as the convalescent annexe for Cliveden, the Friendly Society's Convalescent Home at Dover, the Glack Convalescent Hospital at Deal, Mrs. Fleming's Convalescent Hospital at Luton House, Selling; Lady Northcote's beautiful house at Eastwell Park, Ashford, and Bearwood Park, Wokingham. Many homes have been thrown open to Canadian officers,—Nuneham Park, Oxford; the home of Sir William Harcourt; Holme Pierrepont, offered by Lord Manners; Merlewood, Virginia Water, the home of Sir Donald MacMaster, M.P., and the Moorings, Sunningdale, offered by Mr. Wills. The policy of distributing Canadians among English homes has been abandoned. It was thought that in this way the men from the Dominions overseas would learn to understand and know the people of the home land, but so many petitions have been received from Canadians asking that they might be transferred to centres where they would be with other Canadians, that it has been decided to establish hospitals and convalescent homes exclusively for Canadians. The same decision has been arrived at concerning the men from Australia and New Zealand. As for the Canadian hospitals, the Duchess of Connaught Red Cross Hospital at Cliveden, which has recently been enlarged, is staffed by members of the Canadian Army Medical Corps; the hospitals at Shorncliffe are becoming more and more

Canadian—No. 5 General Hospital, C.E.F., under Lieutenant-Colonel Hart, of Victoria, British Columbia, is at the Shorncliffe Military Hospital—and the Moore Barracks Hospital and the Tent Hospital at St. Martin's Plain are staffed by the Canadian Army Medical Corps, the patients being almost entirely Canadians; the Canadian War Hospital at Walmer is devoted to Canadians, and the Helena Hospital at Shorncliffe has wards reserved for members of the C.E.F. All Canadian tuberculous patients are sent to Pinewood, Wokingham. Canadians who have been "gassed" or who are suffering from the effects of shock will receive treatment at the Granville Hotel, Ramsgate, which has been converted into a hospital; and arrangements are being made for other hospitals where special treatment will be given.

Mention has already been made of the Anglo-Russian Hospital, which was organized in London some months ago for service in Russia as practical evidence of the sympathy of the British with the Russian people. The hospital is to be established in the Dmitri Palace in Petrograd. An advance party left England some time ago and on November 2nd, a further part of the medical staff, with nurses and orderlies, left London for Petrograd.

The Evans Memorial for Clinical Research is desirous of coming into communication with as many physicians as possible who have used bacterial vaccines in the treatment of typhoid fever for the purpose of collecting statistics concerning the efficiency or non-efficiency of the method as a therapeutic measure. If any who have done this even with only one or a few cases will send their names and addresses blank forms will be sent to them upon which uniform reports may be made. Due credit will be given to each in any reports that may be published. Kindly address all communications to Dr. W. H. Watters, 80 East Concord St., Boston, Mass.

The 3rd Australian General Hospital left for England on May 19th, and is now stationed at Lemnos Island, in the Ægean Sea; this unit is under the command of Colonel Fiaschi, D.S.O., of Sydney, New South Wales. The 1st General Hospital, which is at Cairo, was originally under the command of Lieutenant-Colonel Ramsey Smith, head of the Health Department of South Australia. Lieutenant-Colonel Smith, however, has been recalled, and the unit is now in command of Lieutenant-Colonel H. Maudsley. The 2nd General Hospital of the Australian Expeditionary Forces is under the command of Lieutenant-Colonel T. M. Martin. According to the *Medical Journal of Australia*, up to February 3rd, 1915, the Commonwealth had contributed, in addition to these general hospitals, No. 1 Stationary Hospital from South Australia; No. 2 Stationary Hospital from Western Australia; No. 1 Clearing Hospital from Tasmania; No. 1 Field Ambulance from New South Wales; No. 2 Field Ambulance from Victoria; No. 3 Field Ambulance from Queensland, South Australia, Western Australia, and Tasmania; No. 4 Field Ambulance from Victoria, South Australia, and Western Australia; and Nos. 1, 2, and 3 Light Horse Field Ambulance Corps. A large number of members of the profession, of course, are on active service in the capacity of Regimental Medical Officers, or with the Royal and Australian Army Medical Corps.

As a natural consequence of the enlistment of large numbers of men, a greatly increased demand has arisen for trained women workers. In medicine perhaps this is particularly true, for not only are women physicians needed to replace the men who have joined the Royal Army Medical Corps or the staff of a military hospital, but they are also doing valuable work at the front where they have earned the warm praise of Sir Alfred Keogh. Their work has found favour in the eyes of the British War Office and units organized, equipped, and manned! by women, which were refused recognition at the commencement of the war are now under military inspection. In England as early as last February, at least five military hospitals had been equipped and staffed entirely by women; three others have been organized and equipped by women, and half of the members of the staff of two additional units are women. A hospital of one hundred beds was organized by Drs. Garrett Anderson and Flora Murray, and commenced work in Paris under the ægis of the Union des Femmes de France early in September, 1914. In October, a branch hospital of seventy beds was established at Wimereux; the medical supplies, stores, etc., for this unit were provided by the British War Office. The Women's Hospital Unit, in charge of Mrs. St. Clair Stobart, was equipped by the Women's Imperial League, and established in Antwerp in September, 1914. The bombardment of that city and its subsequent occupation by the Germans made it impossible for the unit to stay there after October 7th, and it was only with great difficulty that the wounded were conveyed to safety and the members of the staff succeeded in reaching England via Ostend. This unit was afterwards sent to Serbia. The hospital under the command of Dr. Florence Stoney was also in Belgium until the fall of Antwerp; it is now at Cherbourg working under the French Red Cross.

The three units supplied by the Scottish Federation of the National Women's Union are worthy of especial mention as doing work of particular value. They are, (1) A field hospital under the command of Dr. Agnes Savill, stationed near Chantilly, France, in the old Abbaye de Royaumont. This unit is under the French Red Cross and is known as L'hôpital auxiliare 301; it has accommodation for two hundred patients and its staff, over fifty in number, is composed entirely of women: it was the first hospital in the district to be equipped with *x*-ray apparatus. (2) The first Serbian unit which arrived at Kragujevatz on January 6th, 1914, and immediately on arrival received one hundred and fifty wounded from the Serbian government. (3) The second

Serbian unit which was sent at the request of the Serbian government. This is a mobile base hospital with equipment and tent accommodation for two hundred patients; it also has a bacteriological laboratory and is under the command of Dr. Alice Hutchison. On its way to Serbia, the unit was detained for a fortnight at Malta to assist in the reception of one thousand wounded, which had arrived unexpectedly. On arrival in Serbia, the hospital was stationed at Valejvo. A third Serbian unit has been under consideration for some time.

The women's colleges of Girton and Newnham at Cambridge University contributed £1,800 to the Scottish Women's Hospital Committee and, at the request of the French military authorities, the money was expended on equipment for a two hundred bed hospital which was sent to Troyes. It is under the administration of Mrs. Harley, the sister of Sir John French, and is manned by women physicians, nurses, and orderlies.

On June 3rd, last, a hospital under the command of Dr. Isobel Ormiston, left England for Montenegro, where it has been doing splendid work. This unit was provided by the Wounded Allies Relief Committee. Dr. Garrett Anderson is now in charge of a military hospital of five hundred beds in London, and has been given the military rank of major.

Among our allies, women now hold many important posts. In Russia the Minister of Public Instruction some months ago notified medical colleges that women students who had studied for six semesters or more might be called upon for service in hospitals at the front and in England, France, and Russia the demand for women doctors is greater than the supply. In Germany, on the other hand, although women physicians filled important positions at the beginning of the war, they are no longer employed in hospitals connected with the army medical department. Rumour has it that misunderstandings have led to this decision, but the reason given is that there is a sufficient number of male physicians available for such service.

The following is taken from the presidential address delivered by Sir Donald MacAlister at the one hundred and second session of the General Council of Medical Education and Registration, as reported in the *British Medical Journal* of November 6th, last: "As to the future supply of persons duly qualified to fill our depleted ranks, the prospects are dubious. From the British Dominions and from other countries about two hundred and forty practitioners have this year been registered in the *Colonial List* and the *Foreign List.* Orders in Council have applied the Medical Act (1886) to Ontario and Saskatchewan; and communications are daily expected from the three Western Provinces of Canada in which that Act is not yet operative, that will enable us to establish reciprocity with them. There is reason to think that, when the arrangements with the Dominion are complete, a consummation which we devoutly wish to hasten, the number of Canadian practitioners on the *Medical Register* will be considerably increased. The new men will be as heartily welcome as those who have already come to our aid from Eastern Canada, Australasia, and South Africa. But in case my words should reach any intending applicants for registration who are still in Canada, I would impress upon them the necessity of ensuring that they not only hold a recognized diploma from their provincial university or college, but are legally entitled to practise in the province itself. This last is required, as a condition of reciprocity, both by Canadian and Imperial law. The neglect of the condition has in some cases caused delay in registration, which the Registrar regrets but cannot avoid." This, however, is no longer necessary for arrangements have now been made whereby a practitioner, who is a graduate of a recognised university, may join the Royal Army Medical Corps, the Canadian Army Medical Corps, or the medical services of the expeditionary forces, without first obtaining a provincial license to practise.

A large number of Canadian doctors have already gone overseas but as the number of men on active service increases, more and more medical men are required, and during the next few months every qualified man of suitable age, who is fit for the work of an officer in a medical corps will be needed at the front. The British Medical Association has sent out a personal appeal to every member of the profession in Great Britain and the Dominions overseas, and we would impress upon all members of the profession in Canada who are able to give their services the urgent need for medical men that exists in the present emergency. Those who already have attained the age limit prescribed, i.e., physicians and surgeons over forty years of age, are asked to assist the younger men to enlist by assuming part of their work and safeguarding their interests during the period of absence; or they may offer their services to the Imperial authorities for six or twelve months. In the first case, their services will be utilized in England; in the second case, they will be given a temporary commission in the R.A.M.C. and will be sent to such stations as Malta, Gibraltar, or Cairo. An allowance of $150 is made for outfit, the remuneration is $5 a day with 43 cents for ration allowance, and a gratuity of $300 is paid on the termination of the engagement. In the case of those who volunteer for six months the gratuity is $75 only.

Sir Donald MacAlister referred to the enlistment of medical students of the first three years and their consequent withdrawal from professional instruction. He mentioned the uncertainty existing amongst such students as to whether they should offer themselves for combatant service or continue their studies and so fit themselves for qualified service later on. Thus far the War Office has failed to offer any clear guidance in this matter and efforts are being made by Sir Donald to procure a definite pronouncement which will set the question at rest. Considerable numbers of medical students are employed on minor vessels which are auxiliary to the larger ships, which carry a proper surgical staff and equipment. A surgical probationer is stationed on the smaller craft, who is capable of rendering first aid to the injured until they can be transferred to the parent ship, and for this work medical students, who have completed their physiological and anatomical studies, and have been instructed in surgical dressing, are preferred. In this connexion, the following statement was made by Sir Donald MacAlister: "The Medical Director-General authorizes me to make it known that any probationer who, after (say) six months' service, desires to present himself for a professional examination, or to resume his studies with a view to qualification, will be granted leave of absence, or be demobilized, at his own request. A less senior student may then be appointed probationer in his place for a similar period of service, and at its expiry he can return to his studies in like manner. By such a rotation of service a succession of students might continue to be employed in war work that is relevant to their future profession and the qualification of none would be unduly delayed. The requirement of the licensing bodies, that every student should act for six months as surgical dresser, may be deemed to be fulfilled by corresponding service as surgical probationer."

A HOSPITAL for wounded Indian soldiers has been established at Brighton, England, by the Indian Medical Service. It has accommodation for two thousand patients, and its personnel includes officers of the Indian Medical Service, assistant surgeons (natives and Eurasians) belonging to the Indian Subordinate Medical Department, Indian nursing orderlies, water carriers, washermen, sweepers, etc. The various castes represented by patients and staff make the preparation of food an extremely complicated affair, for a cook must be of the same or a higher caste than the patient for whom he cooks. Again, a Mohammedan will eat beef, but to the Hindu the cow is a sacred animal; and a sheep must be slaughtered in a circumscribed manner according as it is to be eaten by a Hindu or a Mohammedan. In order that such customs may be adhered to, a special slaughter house has been provided in the grounds of the county abattoir.

Book Reviews

APPLIED IMMUNOLOGY. The Practical Application of Sera and Bacterins Prophylactically, Diagnostically and Therapeutically. With an appendix on Serum Treatment of Hemorrhage, Organotherapy and Chemotherapy. By B. A. THOMAS, A.M., M.D., professor of genito-urinary surgery in the Polyclinic Hospital and College for Graduates in Medicine, and R. H. IVY, M.D., D.D.S., assistant instructor in surgery in the University of Pennsylvania. Philadelphia and London: J. B. Lippincott Company.

In this volume the authors have placed before the general practitioners, as well as laboratory experts, a most lucid exposition of the subject of immunology. No book of its kind has presented the subject so simply, so practically, or so within the scope of the practitioner's time and understanding.

The chapter of fixation of complement gives the reader a very clear understanding of the practical side of the subject, while the explanation of specific bacterial reactions, which is well illustrated, draws attention to the diagnostic and therapeutic uses of this feature of implying immunology in a very satisfactory manner.

We do not think that the positive reaction of von Pirquet's tests present altogether an accurate picture of that test, which is not necessarily negative if a pustule does not appear.

The views of tuberculin therapy are perhaps a little bit optimistic, but the author's experience is probably wider than is that of some other observers. In the appendix there is an excellent chapter on techique, in which the illustrations give a most satisfying explanation of methods.

All in all, the book is to be commended to all those who wish to acquire a ready understanding of the practical applications of immunology.

A FIFTH Universities' Company is now being recruited at Montreal, under Captain S. A. Eve, and eventually will go overseas as reinforcements to the Princess Patricia's Canadian Light Infantry.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

THE WORK OF OUR HANDS. A Study of Occupations for Invalids. By HERBERT J. HALL, M.D., and MERTICE M. C. BUCK. Publishers, Moffat, Yard & Company, New York, 1915.

EMERGENCY SURGERY. By JOHN W. SLUSS, A.M., M.D., associate professor of surgery, Indiana University School of Medicine. Third edition, revised and enlarged with 685 illustrations some of which are printed in colours. Publishers, P. Blakiston's Sons & Company, 1012 Walnut Street, Philadelphia, 1915. Price $4.00 net.

MATERIA MEDICA AND THERAPEUTICS: A TEXT-BOOK FOR NURSES. By LINETTE A. PARKER, B.Sc. (Columbia University), R.N. Publishers, Lea & Febiger, Philadelphia and New York, 1915. Price $1.75 net.

THE OPERATIONS OF SURGERY (JACOBSON). Sixth Edition. By R. P. ROWLANDS, M.S., LOND., F.R.C.S., ENG., surgeon to Guy's Hospital; and PHILIP TURNER, B.Sc., M.S., LOND., F.R.C.S., ENG., surgeon to Guy's Hospital. With 797 illustrations (40 in colours). Vol. I., THE UPPER EXTREMITY; THE HEAD AND NECK; THE THORAX; THE LOWER EXTREMITY; THE VERTEBRAL COLUMN. VOL. II., THE ABDOMEN. Publishers, The Macmillan Company of Canada, Toronto, 1915.

BULLETIN, YELLOW FEVER COMMISSION (WEST AFRICA). REPORTS ON QUESTIONS CONNECTED WITH THE INVESTIGATION OF NON-MALARIAL FEVERS IN WEST AFRICA. Vol. I. and II. Published by The University Press of Liverpool, 57 Ashton Street, Liverpool, 1915. Price, Vols. I and II, 25s net.

THE MEDICAL PROFESSION OF ONTARIO VERSUS THE IRREGULAR PRACTITIONER

The following is the statement made by Dr. H. B. Anderson, President of the Ontario Medical Association, before the Medical Commission under the Honourable Mr. Justice F. E. Hodgins.

Your Lordship:

The Ontario Medical Association was organized in 1880. Its ordinary membership consists of regularly qualified, medical practitioners in good standing, resident in the province, or those engaged in teaching or research work in medicine or the allied sciences, in the province of Ontario. It is the Ontario Branch of the Canadian Medical Association. The present membership is about one thousand, and includes the leading practitioners of the province.

Article 3 of the Constitution of the Ontario Branch of the Canadian Medical Association reads:

"Objects of the association:

1. The cultivation of the science of medicine and surgery.
2. The advancement of the character and honour of the medical profession.
3. The elevation of the standard of medical education.
4. The promotion of public health.
5. The furtherance of unity and harmony among its members.
6. To form the connecting link between the members of the profession of the province and the Canadian Medical Association, in accordance with Article 4 of the Constitution of the Canadian Medical Association."

At the outset, may I direct attention to the fact that the legislation passed from time to time to regulate medical practice in Upper Canada, afterwards the province of Ontario, culminating in the laws under which we are now governed, was for the purpose of affording protection to the individual and the community from unskilled, ignorant, medical practitioners and quacks, by whom the country was overrun at an early period in the history of the province. So much was this the case that there was a public outcry and demand for protective legislation. To substantiate these statements, may I submit the following:

"The Medical Profession in Upper Canada, Canniff, p. 26—Extract from an article contributed by the late Bishop Strachan, 1812:

"The province is overrun with self-made physicians who have no pretensions to knowledge of any kind, and yet there is no profession that requires more extensive information. They comprehend not the causes or nature of disease, are totally ignorant of anatomy, chemistry and botany; many know nothing of classical learning or general science. Where shall you find *one* among them, attending particularly to the age, constitution and circumstances of the patient, and varying his prescriptions accordingly. It is indeed preposterous to expect judgement and skill, a nice discrimination of diseases or a proper method of cure from men who have never been regularly taught, who cannot pronounce, much less explain, the terms of the art they profess, and who are unable to read the books written upon the subject. The welfare of the people calls aloud for some legislative provision that shall remedy this increasing evil; and examination, however, slight, would terrify nine-tenths of the present race."

A type of practitioner commonly found at this period is exemplified by the following extracts:

"Richmond, October 17, 1817—ADVERTISEMENT—This is to certify that I, Solomon Albert, is Good to cure any sore, or any Complaint or any Pains, Rheumaticks Pains, or any Complaint what so ever the subscriber doctors with yerbs or Roots. Any person wishing to employ him will find him at Dick Bells. (Signed) Solomon Albert.

Page 28—"That illiterate and incompetent persons found their way into Upper Canada during the first fifteen years of this century may be gathered from letters which appeared in the Kingston *Gazette*. In the *Gazette* of June 2nd, 1812, is a letter from Gananoque, signed 'Candidus' giving a copy of an account sent to Mrs. John Gould by a 'self-taught physician of this province'— 'The estate of Mrs. J. Gould Dr. To dr. for medsin and attendants whene he was choked with a large peas of butter no meat £3. A second letter, signed '*Credulus*' refers to 'certain medical gentlemen who have out of pure charity come into this country from the neighbouring States to cure us of all our maladies.' They do not use opium, or calomel, but charms. He gives an account of the treatment of a tumour *by stroking and using certain words to drive away 'the devil's swelling.'* A third letter is about a shoemaker who went where unknown to practise and who being called to see a case of dropsy pronounced it pleurisy, and declared that 'fleglottomy' was demanded to reduce the body to natural size; but on being exposed took a hasty departure.

"A fourth letter refers to a bill sent in by a doctor, with a deduction of £6 for 'killing your son.' This was because the doctor had carried the smallpox to the son, who died of it.

"The following is an indication that at Kingston, in 1815, the more intelligent public saw the necessity of protection against incompetent men. The Kingston *Gazette* contains the following:

"To the public. *Facilis descensus Averni.* The Parliament of the province, during the last session, provided in part against the imposition of empirics in medicine. This was not more necessary for the safety of the diseased than the reputation of the faculty.' Then follows an earnest appeal to the public and Parliament against quacks, their danger 'without one ray of science' who 'presume to thrust the created into the presence of the Creator.' Signed 'W.' (Not of the profession he says.)"

It was not a question of conferring unusual privileges on a body of medical men for their own benefit, or of creating a monopoly, but of giving them power to ensure to the people of the province the services of well-educated, properly trained practitioners to attend them in sickness. We believe it, therefore, of much importance that there be a clear understanding of the chaotic and unsatisfactory condition of medical practice which gave rise to the public clamour for protection, and which resulted eventually in the establishment of the College of Physicians and Surgeons of Ontario.

The Ontario Medical Association believes that the College of Physicians and Surgeons, our universities and other organizations having control of the education and licensing of medical practitioners, have honourably and fairly discharged their duties in the public interest. The doors of the profession always have been and now are open for the admission of any who comply with the common regulations regarding education, training and examinations. In no sense of the word may the profession of medicine in Ontario be considered a close corporation.

The Ontario Medical Association holds that every person before being legally entitled to treat the sick should comply with the same educational conditions; whatever the system of treatment may be, it can be most intelligently carried out by one who is properly educated. This applies alike to preliminary as well as to scientific or professional education.

To understand disease and treat it intelligently necessitates a knowledge of the structure and functions of the body in health, as well as of the various conditions acting upon the body to produce change or derangement of these structures or functions—that is, disease. To be able to understand and treat disease intelligently, therefore, requires a proper training in anatomy, and physiology, by which we learn normal structure and function; in pathology, anatomy and pathological chemistry, by which we learn of the changes in structure and function encountered in disease; in chemistry, physics and bacteriology, in order to understand the conditions acting upon the individual to produce disease, and to acquire information necessary to apply preventive measures, requisite alike to ward off disease in the individual and to protect the public, as in the case of infectious disease.

A study of the signs, symptoms and course of different diseases is necessary in order to be able to recognize them and to diagnose or differentiate one disease from another. Hence, proper clinical training is a prerequisite of *any intelligent plan of treatment*, as it is obviously impossible to apply treatment properly or with safety until one knows what the disease or condition is that he seeks to remedy. These principles of necessity apply with equal force to whatever the mode or system of treatment, which may be deemed most useful or advisable for the relief of the disease, when once it has been recognized.

It follows, therefore, that the same scientific and clinical training is a prerequisite *for all forms of treatment.* The arbitrary belief in any special dogma, system or plan of treatment can in no way relieve one of the necessity for this training in the fundaments of intelligent practice. The irregular systems of practice do not claim a special form of anatomy, physiology, chemistry, physics or bacteriology. Once the would-be practitioner is properly trained and legally qualified, no restriction is, or should be placed on his freedom to obtain further knowledge in any form of treatment or of the right to practice it within legal and ethical limitations. This is recognized under the medical laws now in force in the province. Only by the acceptance of these underlying principles are equal rights and privileges granted to all, the safety of the public protected and medical science promoted.

In the countries of Europe these principles are recognized as underlying every legalized form of practice. For the state to recognize the right of any to practise medicine without the knowledge to be acquired only by training in the before-mentioned subjects, is to expose not only the individual but the public to grave dangers. The inability to diagnose may allow a patient with a diseased spinal column to be manipulated, producing dislocation, crushing of the spinal cord, paralysis and death; a tuberculous joint may be manipulated and the disease disseminated; an aneurism may be ruptured; apoplexy produced in a patient with high blood pressure or death result from manipulation of a goitre. Massage, manipulation, mechanotherapy, hydrotherapy and other drugless forms of treatment, are recognized and practised as a part of general medicine and require for their safe application the same ability to diagnose and select the proper cases as with medicinal treatment.

The public health would be endangered from any inability, owing to defective training, to recognize diphtheria, typhoid, syphilis, or other infectious disease, which depend for their diagnosis on clinical training and the knowledge to apply modern laboratory methods.

In medico-legal cases and death certification, the inability to recognize the disease being treated or the cause of death would open the door to possibilities too obvious to require emphasis.

Life and accident insurance companies have interests which depend upon the ability to diagnose accurately and manage properly diseases and injuries.

Modern medicine is opposed to the recognition of any special dogma or exclusive theory of practice, because acceptance of such excludes the necessity for testing out these theories, and the careful investigation and weighing of facts upon which scientific knowledge and practice depend for their advancement. At the same time, it recognizes and encourages the investigation of every form of treatment in so far as it is without danger to the individual or the community.

Provision has been made in the provincial university and in other universities of the province at great expense to the public, to furnish proper education and scientific training which are prerequisite to treatment. The privileges of these institutions are open to all who prepare themselves to take advantage of them.

We believe that the government would stultify itself by expending large sums to equip and maintain institutions to provide proper scientific training if illiterate, inferiorly educated or untrained persons were granted the right to practise.

The Ontario Medical Association, whose members have had to comply with the educational requirements of these institutions and to pass the examinations prescribed to qualify them to practise, is opposed to the admission to practise on different terms of, the graduates of inferior, proprietary institutions of a foreign country. We believe that all should enter by the same door. The report of the Carnegie Foundation (1910, p. 163-6) says of the osteopathic schools of the United States: "The eight osteopathic schools fairly reek with commercialism. Their catalogues are a mass of hysterical exaggerations alike of the earning and curative power of osteopathy." "It is impossible to say upon which score the 'science' most confidently appeals to the crude boys or disappointed men and women whom it successfully exploits. Standards those concerns have none, etc." These are the statements made after an exhaustive investigation by commissioners who were not medical men.

The members of our Association in order to qualify themselves for specialized practice, have had to spend often many years in postgraduate study abroad to extend their knowledge. If those wishing to undertake other special forms of practice have to go elsewhere for training or to extend their knowledge, after graduation in the regular way, they have a similar right and opportunity to do so; and for this no special legislation is required.

May we also point out the claims which the body of regular practitioners have for asking consideration of their views, by reason of the gratuitous medical services which they have always rendered the indigent, and their efforts in furthering preventive medicine and promoting the public health.

At the present time hundreds of the doctors of this province are overseas in the service of their country, and many hundreds of these at home are caring for the needy dependents of our soldiers. We submit that at such a time and in the absence of many from the country, it would be an act of injustice and ingratitude on the part of the province to give legal status to any body of inferiorly trained persons to practise and thus to jeopardize their interests unnecessarily.

In the questions now at issue, the Ontario Medical Association wishes to place itself on record as taking the broadest possible ground in the interests of the community, for the advancement of the science and practice of medicine—preventive as well as curative—as well as for the safety of the sick and ailing. We seek only equal rights for all in upholding those principles which are essential alike for the safety of the sick and ailing, and for the promotion of medical knowledge and practice in all its branches, which principles in this province were established primarily for the protection of the people from the dangers of incompetent medical practice and quackery.

Obituary

THE RIGHT HONOURABLE SIR CHARLES TUPPER, Bt., died October 30th at the ripe age of ninety-four years. Born at Amherst, Nova Scotia, on July 2nd, 1821, he was the son of a Baptist clergyman, of New England stock, a descendant of Thomas Tupper who emigrated from England in 1635. His education was received at Acadia University, and in 1839 he entered upon the study of medicine at the University of Edinburgh, where he graduated in 1843. In 1855 Sir Charles entered the Nova Scotia Assembly as member for Cumberland. He took an active part in the preliminaries to Confederation and became Prime Minister of the province of Nova Scotia. In 1870, he became President of the Privy Council; in 1872, Minister of Inland Revenue; in 1873, Minister of Customs; in 1878, Minister of Public Works; in 1879, Minister of Railways and Canals, and in 1883, High Commissioner in London for the Dominion. In 1887 Sir Charles returned to Canada and for a short period was Minister of Finance; the following year, however, he returned to London. In 1896, he became Prime Minister of Canada. After the defeat of his party, he was leader of the Opposition until his retirement from public life in 1900. During the course of a distinguished career many honours fell to his share, and Sir Charles Tupper leaves behind him an honourable record and a great name of which Canada will ever be proud. Although it is as a politician that he will be remembered, he practised his profession at intervals at Ottawa, Halifax, and Toronto; he retained a lively interest in the progress of medicine, and assisted in the formation of the Canadian Medical Association.

DR. LESLIE TUTTLE, of Tweed, Ontario, died November 13th. Dr. Tuttle had practised in Tweed for more than forty years. He was sixty-nine years of age.

DR. ALFRED BOWLBY, of Waterford, Ontario, died November 8th, in the ninety-sixth year of his age. Born at Round Plains in 1820, Dr. Bowlby attended the Simcoe Grammar School, and afterwards read medicine with Dr. Park, of Simcoe. He obtained his degree in medicine from New York, and then from McGill University and went into practice at Waterford in 1846, where he continued to practise for almost seventy years, in fact until a few weeks before his death.

DR. ANTHONY FREELAND, of Ottawa, died suddenly November 3rd, in the sixtieth year of his age. Dr. Freeland was born at Quebec in 1856 of Irish parentage. Much of his early life was spent at Burritt's Rapids; later, he attended the Ottawa Collegiate Institute and the Normal School, and for several years was principal of the separate school at Prescott. He then entered Queen's University, from which he graduated as M D. in 1889, and the following year took up practice in Ottawa. This, however, he gave up about fourteen years ago. He became collector of inland revenue at Ottawa. He was a strong supporter of the French Canadians in the bilingual school controversy.

DR. W. H. CLAPP, of Toronto, died November 20th, at the age of fifty. Dr. Clapp practised at Scarboro and at Toronto, but gave up his professional work some years ago.

DR. WILLIAM THEOPHILUS STUART, of Oakville, Ontario, died November 13th, in the sixty-third year of his age. Dr. Stuart formerly practised in Toronto, and was professor of anatomy and chemistry at the Ontario Dental College for many years. Dr. Stuart was Surgeon-Major in the 48th Highlanders, and was instrumental in organizing that regiment.

Dr. S. A. St. Amour, of Chicago, dropped dead October 18th. He was fifty-three years of age and was a native of Cheboygan, Ontario. He went to Chicago eighteen years ago and had built up a large practice there.

Dr. Horatio L. Foster, of Reed City, Michigan, died suddenly November 8th. Dr. Foster was a Canadian by birth and was born in Waterford, Ontario, in 1857. He graduated from the New York Medical College in 1881.

Dr. John Brandon died at Calgary on October 29th, in the seventy-fifth year of his age. Born in the County of Tyrone, Ireland, he came to Canada with his parents in 1852. His early years were spent on a farm in Lambton County; by dint of persistent study, he became a teacher, and some years later was able to enter the McGill Medical College from which he graduated in 1866. He commenced to practise in the village of Ancaster, where he laboured until about four years ago, when he went to Hamilton. Dr. Brandon saw active service at the time of the Fenian Raid of 1866.

Dr. Louis Duhamel, registrar for Wright County, Ontario, died October 27th.

The Honourable James Edwin Robertson, M.D., died at Montague, Prince Edward Island, October 19th, in the seventy-sixth year of his age. Dr. Robertson was born at New Peith, Prince Edward Island, in 1840; he was educated at the Charlottetown Academy, and later entered McGill University, where he graduated M.D. in 1865. He became a member of the provincial parliament in 1870, a member of the House of Commons in 1882, and a member of the Senate in 1902.

Dr. Homer Crowe, of Belmont, Nova Scotia, died October 18th. Dr. Crowe, who was in his seventy-sixth year, had been ailing for some time. He was born at Onslow and read medicine with the late Dr. Samuel Muir, of Truro.

Dr. Adam Lynd, of Toronto, died September 30th, in the seventy-first year of his age. Born at Aurora, Dr. Lynd graduated from Trinity Medical College and at once went into practice in Parkdale where he continued to practise for thirty-five years. He was greatly interested in municipal affairs and at one time was mayor of Parkdale. A widow, one son, and three daughters survive him.

Senator William MacKay, M.D., died at Reserve Mines, Nova Scotia, on Monday, November 8th. Dr. MacKay was born at Earltown on September 11th, 1858, of Scotch parentage; he was educated at Truro and entered upon the study of medicine at Bellevue Medical College, New York, where he graduated in 1873. In the same year he went into practice at Glace Bay and, although much of his time was devoted to political matters, he continued to practise until a few days before his death. In 1874, Dr. MacKay was appointed resident physician to the Lorway, Emery, and Reserve collieries. He is said to have been the first physician who quarantined cases of diphtheria and his system was subsequently applied by the municipal council to the whole of Cape Breton County. In 1888, Dr. MacKay, in association with Dr. Edward Farrell, was instrumental in framing the Public Health Act of Nova Scotia. In 1886, Dr. MacKay was elected to represent Cape Breton County in the legislative assembly and soon became leader of the Opposition, a position which he filled with ability for the ensuing five years. He was defeated in 1890, but re-elected in 1894 and again chosen leader of the Liberal-Conservative party. In 1897 he was again defeated, and in 1912 was summoned to the Senate. His son, Major Daniel S. MacKay, M.D., is attached to one of the Winnipeg regiments in France.

Dr. Walter Humphries Montague, of Winnipeg, died of apoplexy November 15th. Dr. Montague was born at Adelaide, Ontario, in November 1858, and was the son of Joseph Montague, a farmer. He commenced a remarkable career as an errand boy in a country store. He succeeded in qualifying himself for a teacher's certificate at the Woodstock College, and afterwards entered the Toronto School of Medicine as a student of that subject, going from there to Victoria University where he obtained his degree. He was admitted to the College of Physicians and Surgeons of Ontario and to the Royal College of Physicians, Edinburgh, and went into practice at Dunnville, Ontario, where he showed an active interest in the work of the Conservative party. In 1883 he was an unsuccessful candidate for the Ontario legislature, and was first elected to the House of Commons in 1887. The election was voided but he was reëlected the same year, that election also being annulled by the Supreme Court of Canada. In December, 1894, Dr. Montague entered the Bowell administration without portfolio and the following year became Minister of Agriculture, which office he retained under the Tupper government until July, 1896. In 1908, he removed to Manitoba and, in 1913, was appointed Minister of Public Works. On the resignation of the Roblin government some months ago, he, with his colleagues, was indicted in connexion with the investigation into the construction of the Parliament Buildings at Winnipeg. Dr. Montague leaves a widow, two daughters, and two sons, Captain R. J. Montague, who is staff captain for General Ketchen, and Captain F. Montague, A.D.C. to General Turner.

News

MARITIME PROVINCES

Dr. A. Noble, of Sydney, has been appointed provost marshal for the Island of Cape Breton, with the rank of captain, under the Sixth Division at Halifax. Captain Noble's appointment is in recognition of services rendered to the military authorities during the past fourteen months.

ONTARIO

A large number of cases of measles and diphtheria were reported in the province during the month of October, when the following cases of infectious disease occurred: diphtheria, 310 cases, 13 deaths; measles, 400 cases, 6 deaths; typhoid, 155 cases, 27 deaths; scarlet fever, 57 cases, 3 deaths; whooping cough, 61 cases, 2 deaths; smallpox, 5 cases; tuberculosis, 114 cases, 61 deaths; infantile paralysis, 4 cases, 1 death; cerebrospinal meningitis, 10 cases, 9 deaths.

Several cases of smallpox, of a mild form, have been reported in the neighbourhood of Dunnville. General vaccination has been urged for all those who have not been vaccinated within the last seven years and provision has been made for the vaccination of those who cannot afford to pay. All school children have been vaccinated.

Dr. Douglas L. Ewan, of St. Thomas, has been appointed associate coroner for Elgin County.

Reports of a satisfactory year of work have been submitted at the annual meetings of many hospitals in the province. At the Owen Sound General and Marine Hospital the number of patients treated was 474, and 47 births and 26 deaths occurred; this hospital contains 57 beds. The Smiths Falls Public Hospital, during its sixth year of activity, received 501 patients; 51 births and 17 deaths took place; the net deficit amounted to $1,352. Five hundred and thirty admissions were made at the Royal Victoria Hospital, Barrie, and 18 deaths and 95 births were recorded; the total number of days of treatment was 12,949, and the financial statement showed a deficit amounting to $107.34. At the Bowmanville Hospital, 207 patients were admitted; 16 births and 13 deaths occurred. The Galt Hospital admitted 576 patients during the year; the births numbered 64 and the deaths 48; 11,291 days of treatment were given; the financial statement showed a balance on the right side amounting to over $500. Two hundred and eighty-eight admissions were made and 33 births occurred at the Victoria Hospital, Renfrew. At the Cornwall General Hospital 757 patients received treatment, as compared with 638 during the previous twelve months. The days of treatment numbered 11,735 as compared with 9,853 in 1914. The number of patients who received treatment in the Wingham General Hospital was 135, the days of treatment being 2,003; these figures are slightly in excess of those for the previous year. The report of the year's activity at the Ross Memorial Hospital, Lindsay, shows that 449 patients were treated, including 58 soldiers; 195 operations were performed; there were 22 births and 25 deaths, the total number of days of treatment was 6,382, the daily cost of maintenance per patient being $1.85. At the General and Marine Hospital, Collingwood, treatment was given to 400 patients; 28 births and 28 deaths occurred; the daily cost of maintenance was 98 cents per patient. One hundred and eighty-nine patients were admitted to the Cobourg Hospital during the past year, 65 operations were performed, and 3,197 days treatment were given. The hospital work has been much facilitated by the convenient new building with its equipment.

The name of the Cochrane General Hospital has been changed to "The Lady Minto Hospital at Cochrane." A grant of three thousand dollars has been made to the hospital by the Executive Council of the Victorian Order of Nurses for Canada, with which the hospital is affiliated.

The Nurses' Home, which has been built in connexion with the Oshawa Hospital, was opened on October 29th.

Dr. Charles Dunfield has been appointed medical officer of health at Parry Sound.

Dr. M. F. Coglan has been appointed acting superintendent of the Kingston General Hospital, in succession to Dr. D. A. Coon who resigned recently.

It is announced that the Ladies' Board of the Western Hospital, Toronto, intend to erect a memorial building which shall be known as the Edith Cavell Nurses' Home. The necessary amount, which is estimated at $100,000, will be raised by subscription.

The following is the list of candidates who have successfully passed the recent examinations of the College of Physicians and Surgeons of Ontario: John David Henry White Barnett, St. Mary's, Ontario; John Reginald Boyd, Meaford, Ontario; Robert McDonald Cairns, Ottawa; Bessie Lawrence Oliver, Waterford, Ontario; Herbert Joseph Conroy, Peterboro; Joseph Daly, Iona, P.E.I.; John Alexander Dougan, Lindsay, Ontario; Leslie Clinton Fallis, Toronto; Harry Cleaver Purvis Hazelwood, Toronto; Roy Hartley Henderson, Toronto; Frederick Herbert Jeffery, London, Ontario; John Edward Kane, Kingston; Joseph Arthur Labelle, L'Orignal, Ontario; David Easton Lang, Toronto; Albert George Ley, Markham, Ontario; Donald Sherwood Lighthall, Picton, Ontario; Oliver John Samuel Little, Seaforth, Ontario; Leycester Bancroft Lyon, St. Ann's Bay, Jamaica, W.I.; Russel G. MacRobert, St. George Mansion, Toronto; Charles Gordon Merrick, Kingston; Henry Knight Mitchell, Port Arthur; Edward Wilfred McBain, St. Thomas, Ontario; Hermann Campbell McCaul, Lakeside, Ontario; Alexander Jamieson McIntosh, Toronto; Thomas Arnold

Robinson, St. Mary's, Ontario; William Lipsett Robinson, Toronto; Thomas Joseph Sexton, Port Dalhousie, Ontario; Issachar Reuben Smith, Toronto; John Alexander Stewart, Brockville; Vernon Harcourt Storey, Port Hope; Frederick Henry Sutherland, Toronto; Wilfred Lorne Tyrer, Barrie, Ontario; Carl William Waldron, Toronto; James Howard Walmsley, Montreal; George Douglas Chown, Kingston; William Henry Godfrey, Toronto.

THE new wing of St. Joseph's Hospital at Port Arthur was formally opened on Wednesday, November 17th. It is a five-storied building, with roof-garden and sun-parlours and has been built at a cost of $160,000. The first hospital to be erected on the site of the present building was a two-storied building constructed in 1884, which grew out of the hospital ward established the previous year in St. Joseph's Convent for the treatment of patients from the Canadian Pacific Construction Camp. The building erected in 1884 was not completed until 1895, when the name St. Joseph' was given to it. It was enlarged in 1899 and again in 1905.

QUEBEC

A WARM tribute was paid to the work of the Red Cross by Surgeon-General G. Sterling Ryerson in an address recently delivered at Montreal under the auspices of the Quebec Provincial Branch of the Red Cross. Speaking of the enormous quantity of supplies required, General Ryerson mentioned that during the month of June 500,000 wounded passed through one French depot alone. At the present time, the British Red Cross is spending something like $20,000 a day. The French hospitals are particularly in need of assistance, 900 of which are maintained by the French Red Cross. Three million francs a month is being expended upon assistance to women and children and in Paris alone over 150,000 free meals are given daily. The steep roads, which are often wet and muddy, make it very difficult to use motor ambulances and in future, especially in the winter, only those which are equipped with double rear wheels will be employed.

THE annual convention of the College of Physicians and Surgeons of the province of Quebec took place at Quebec on September 28th and 29th, under the presidency of Dr. Arthur Simard. The sum of one thousand dollars was voted to the Laval Military Hospital.

At the annual meeting of the Dental Association of the province of Quebec, which took place at Laval University, $250 was voted respectively for the British Red Cross Society, the Canadian Red Cross Society, the France-Amerique Committee, and the Laval Military Hospital.

The sanatorium at Ste. Agathe has been placed at the disposal of the government for the treatment of soldiers suffering from tuberculosis on their return from the front. At the seventh annual meeting of the Laurentian Society for the Treatment and Control of Tuberculosis, which took place at Montreal at the beginning of November, the secretary-treasurer stated that the operating expenses had been reduced from $11.34 to $11.27 a week for each patient under treatment. The charge made is $8 a week, and the deficit incurred last year, through the difference in these sums, amounted to $6,000. This was met, however, by private subscriptions. The total debt of the society is $71,275.28. During the year 129 persons received treatment, 87 of whom were discharged. Since the institution was first opened, 321 patients have received treatment and of these 237 were alive at the time the report was made. Of the latter, 170, or 53 per cent., are perfectly well, and 67, or 21 per cent., are well but must observe care. A special vote of thanks was extended to the citizens of Abbotsford for the gift of one thousand dollars; this money was intended for the purchase of a machine gun, but when the government ceased to accept such donations, the amount was given to the sanatorium at Ste. Agathe.

MANITOBA

It is announced that the Provincial Board of Health will be reorganized at the next session of the legislature. The present body is composed largely of practitioners who seldom are able to meet. It is probable that the new board will consist of three officials; Dr. Gordon Bell, the present bacteriologist, is mentioned as the probable chairman of the board, and Dr. Stuart Fraser as the epidemiologist. An advisory board of four or five practitioners from various parts of the province will also be appointed.

Dr. Secord has been appointed superintendent of the St. John Ambulance Brigade at Winnipeg in succession to Dr. Moorhead, who has joined the R.A.M.C.

Dr. D. M. Lineham has been appointed physician to the Manitoba Agricultural College.

SASKATCHEWAN

A comparatively small number of cases of infectious disease was reported during the month of October in the city of Saskatoon, namely, typhoid fever, 5 cases; scarlet fever, 2 cases; measles, 1 case; chicken-pox, 4 cases; whooping cough, 3 cases; diphtheria, 1 case; pulmonary tuberculosis, 5 cases; erysipelas, 3 cases.

BRITISH COLUMBIA

A report of the work of the St. John Ambulance Association was submitted at the fifth annual meeting of the Provincial Council, which took place at Victoria, under the presidency of Dr. W. J. Brydone-Jack, of Vancouver. The officers elected for the year 1915-1916 are:—president, Dr. Brydone-Jack, Vancouver; vice-president, Rev. E. G. Miller, Victoria; honorary secretary, Mr. William Burns, Vancouver; honorary treasurer, Mr. C. G. Pennock, Vancouver. The number of members of the executive committee was increased from seven to nine. Mr. C. G. Pennock, of Vancouver, and Mr. A. J. Dallain, of Victoria, were appointed to represent the provincial council at the annual meeting of the Dominion Council.

MEDICAL COLLEGES

Queen's University.

The senate of the university recently passed a resolution to encourage medical students to complete their studies and thus increase their efficiency for military service. The trustees of the university expressed their warm appreciation of the conduct of the students who have given their services to the cause of their country in the present war.

Lieutenant-Colonel W. T. Connell, who accompanied the Queen's Stationary Hospital to Egypt, has returned and has resumed his duties as professor of bacteriology and pathology.

ARMY MEDICAL SERVICES

The following doctors have joined the Royal Army Medical Corps: Dr. K. H. Van Norman, of Toronto, assistant superintendent of Johns Hopkins Hospital, Baltimore; Dr. J. F. Kidd, of Ottawa; Dr. Marr, of Langley Fort, British Columbia; Dr. J. D. Stewart, of Calgary; Dr. Hamelin, of North Battleford; Dr. Harry McDonald, of New Waterford, Cape Breton; Dr. McKenzie, of Woodstock; Dr. T. P. Devlin, of Kaslo, British Columbia; Dr. Ernest Moorhead, of Winnipeg; Dr. Sanders, of Waldo, British Columbia; Dr. Anderson, of Brooks, Alberta; Dr. W. B. Seaton, of Fort Erie, Ontario; Dr. R. T. MacLaren, of Moosomin, Saskatchewan; Dr. R. D. Orok, of Winnipeg; Dr. J. P. MacDonald, of Edmonton; Dr. Geoffrey A. Barss, of Dartmouth, Nova Scotia; and Dr. Racey, of Parkhill, Ontario; Dr. J. R. L. Christian, of Edmonton; Dr. E. F. Dunham, of Govan, Saskatchewan.

Dr. D. E. Staunton Wishart, R.A.M.C., is convalescing from an attack of pyrexia in the Bulkely Convalescent Home, Alexandria. He has been mainly occupied on a "drifter", in conveying wounded and sick from the peninusla to hospital ships.

Dr. J. Arthur Sutherland left Toronto in October expecting to enter the service of the French Army Medical Corps. Dr. Sutherland has been in practice in British Columbia and Alaska.

Dr. W. E. Dean, of Toronto, has joined the staff of No. 4 General Hospital.

It is announced that Major F. B. Carron, M.D., has been appointed supervisor of military hospitals in England. Dr. Carron is a graduate of McGill University and was in practice at Brockville, Ontario, before leaving for England with the second contingent C.E.F. He saw active service in the Boer War.

Dr. A. J. Fisher, of New Liskeard, has been appointed captain in the Canadian Army Medical Corps and has left for active service in Europe.

Dr. J. R. Goodall, of Montreal, has been appointed medical officer of the Second Brigade of the Canadian Expeditionary Forces, which comprises the 4th, 5th, and 6th Canadian Mounted Rifles now in France.

No. 2 Canadian Stationary Hospital, under the command of Colonel Shillington, was removed from Le Touquet to Outreau, near Boulogne, where it was quartered in a building which formerly was a large girl's school. Extra accommodation was obtained by the addition of huts and the unit consists of eleven wards, named respectively, Quebec, Ontario, Nova Scotia, New Brunswick, Prince Edward Island, Manitoba, Saskatchewan, Alberta, British Columbia, Yukon, and Ottawa. It is now reported that the unit has been sent to Serbia. Eight thousand patients have already passed through the hospital, of whom five hundred were Canadians. The number of deaths has been small, forty-four in all. It is announced that Colonel Shillington has been appointed A.D.M.S. at Bramshot, near Aldershot, and that the unit is now under the command of Lieutenant-Colonel J. T. Clark, of Quebec. It is announced also that Major H. Elliott, of Cobourg, has joined the staff of the hospital.

Lieutenant J. W. Richardson, R.A.M.C., of Calgary, has returned on leave of absence.

COLONEL MCPHERSON, of Toronto, has returned from France to England and is in charge of Shillington House, a Canadian Convalescent Home at Uxbridge. Another convalescent home which is under the direction of the Canadian authorities is the Granville Hotel at Ramsgate, which is in charge of Colonel Watt, of Winnipeg.

CAPTAIN B. S. HUTCHESON, of Chicago, has been appointed medical officer to the battalion of American-born of Canada, which is in process of formation.

DR. E. V. FREDERICK of Campbellford, Ontario, has been appointed assistant senior surgeon at No. 1 Stationary Hospital, C.E.F., which is now stationed on the Isle of Lemnos.

THE following promotions in the C.A.M.C. are announced from London: Lieutenant-Colonels Lorne Drum and George Septimus Rennie to be temporary colonels; Majors John Thomas Clark and Campbell Keenan to be temporary lieutenant-colonels: Captains George Rowe Philp, John McCombe, Reginald Sterling Pentecost, Francis W. Wilson, Robert Wilson, and Charles Young to be temporary majors. Nursing sisters to matrons: Edith Campbell, Eleanor Charleson, and Violet Nesbitt.

No. 5 General Hospital, C.E.F., which left Victoria in August under the command of Lieutenant-Colonel E. C. Hart, is at present at Shorncliffe, where it has replaced the University of Toronto Military Hospital, No. 4. The arrival of the unit in England was followed by a temporary distribution of its personnel. This was done for the purpose of giving employment to the nurses and non-commissioned officers until the hospital is established in permanent quarters, and opportunity of experience in British hospitals to members of the staff. As was the case with the McGill Hospital, No. 3, the personnel will be reassembled before the unit leaves England. Captain K. D. Panton, who went to the front with the 3rd Field Ambulance from Vancouver, has been transferred to No. 5 General Hospital, with the military rank of Lieutenant-Colonel.

The following is the personnel of the Saskatchewan Military Hospital recommended by the Medical Council of the province, subject to confirmation by the Militia Department: Officer commanding, Major H. E. Munroe, of Saskatoon, who is at present on the staff of No. 1 Stationary Hospital, C.E.F.; Major Irving, of Yorkton, and Major Meek, of Regina; Captains W. Millar, of Battleford, Coles, of Regina, H. A. Stewart, of Saskatoon, Wark, of Moosomin, Craig, of Davidson, Creighton, of Estevan, Scott, of Moose Jaw, Harvey, of Regina, and Armitage, of Saskatoon; registrar and secretary, Lieutenant S. H. Braund, of Regina; quartermaster, Lieutenant P. H. Salmond, of Regina; dental surgeon, Lieutenant Dewitt, of Regina; dispensers, Lieutenants J. H. Thomson, of Moose Jaw, and R. A. Patrick, of Yorkton; matron, Miss Jean Urquhart, of Regina. The entire equipment for the unit has been ordered and probably will be assembled at a point in England. The funds for this purpose have been subscribed in the province of Saskatchewan, and already, although all the amounts have not yet been received, over $24,000 has been contributed.

The Laval Stationary Hospital, No. 6, is to be increased to a General Hospital of one thousand beds.

It is announced that the University of Toronto Hospital, No. 4 General Hospital, has been sent from Egypt to Salonika.

Colonel G. G. Nasmith has returned to Toronto on leave of absence, at the request of the provincial government to complete some important investigations. Colonel Nasmith is the director of the bacteriological laboratories of the Toronto Department of Health. He accompanied the first Canadian Division to France, where he has been in charge of the water supply and sanitation.

Captain James Roberts, of Hamilton, is in charge of a base hospital at the Dardanelles. He has recovered from his recent illness.

Lieutenant H. F. MacKendrick, R.A.M.C., of Galt, Ontario, who was stationed in France with the 31st Casualty Hospital, B.E.F., has returned on leave of absence owing to the illness of Mrs. McKendrick.

Dr. C. C. Bell, of Chatham, has accepted the appointment of assistant director of medical services at London, Ontario.

Dr. D. R. Moore, ex.-M.P.P., of Stanley, New Brunswick, has volunteered for active service. Dr. Moore was formerly medical officer of the 71st Yorkshire Regiment.

Drs. Carl H. Martin and Frederick J. Livingston, of Hamilton, and Dr. E. Sheffield, of Edmonton, all members of the R.A.M.C., are at the Dardanelles.

Dr. J. J. Field, of Regina, is attached to a base hospital at Eastbourne, England.

The Honourable Mrs. Graham Murray has placed her London house at the disposal of the Canadian Red Cross Society, to be converted into a home for Canadian nurses who return from the front.

Dr. J. F. Adamson, R.A.M.C., of Edmonton, is attached to the Floriana Hospital at Malta.

A military medical board has been organized in Simcoe County, Ontario. The county has been divided into three districts; Dr. Lewis, of Barrie, will have charge of the first; Dr. Wallbridge, of Midland, of the second; and Dr. Mackay, of Collingwood, of the third. The board will exercise the functions of a court of appeal, before which a candidate for military examination, rejected by the local examiner, may go.

CASUALTIES

In hospital

Dr. S. S. King, R.A.M.C., of Hampton, New Brunswick (Dardanelles).

Wounded

Lieutenant J. B. Woodrow, R.A.M.C., of Alberta.

The following memorandum to regimental medical officers was recently issued by Lieutenant-Colonel J. T. Fotheringham, A.D.M.S., Second Canadian Division.

Evacuation of Casualties. One of the most important of the duties of a medical officer with a regiment is to organize and superintend the utilization of the means for the rapid and thorough clearing of the wounded from the area of operations. This is important for the following reasons:

1. The early treatment of wounded provides for early return of men to the fighting line by diminishing the chances of infection and shock from prolonged exposure.
2. It increases the facilities for manœuvring.
3. The depressing effect of numbers of unattended wounded on the morale of the battalion is largely diminished.

Success during action will be facilitated by careful preparations beforehand. In making these preparations the regimental medical officer will consider means at his disposal under the following heads:

1. The Regimental Medical Detail.
2. The Regiment.
3. Field Ambulance.

1. Regimental Medical Detail: This detail should be very carefully trained in first aid, special attention being devoted to the question of hæmorrhage and alleviation of pain. The entire detail should be thoroughly acquainted with the technical equipment and its uses. Since they will often be separated from the medical officer and forced to use their own judgement in choosing ways and means of handling cases no trouble should be spared in their train-

ing. They should be taught to use their own judgement and common sense in choosing the time and method for removing patients from trenches and the field. The influence of topography on the choice of aid-posts should be thoroughly gone into with them. Map reading is a subject in which they should be carefully trained.*

2. The Regiment: The regimental medical detail alone is quite inadequate to handle the situation which develops in the course of an ordinary general action. The regimental medical officer will bear in mind that his detail will in all probability be diminished in numbers already weak. In replacing these casualties he will look in the first place to the battalion from which his original detail was drawn. Since regimental stretcher bearers cannot be efficiently trained on the spur of the moment the efficiency of the reinforcements should concern the regimental medical officer when he is training the battalion in the use of the first field dressing and first aid methods. The more men in the battalion who are trained in this the easier it will be for him to replace and supplement his regimental detail when the exigencies of an action may demand it.

(a) Extra means of transporting wounded from the field will be found in the regimental transport. The manner, time and place in which it is used should occupy the attention of the regimental medical officer. The empty supply column of the regiment is a valuable means for removing cases from the field.

(b) Extra bearer parties. By consulting with the commanding officer of the unit the regimental medical officer will obtain information as to men available for this work. They have been drawn from the transport and the quartermaster's departments. Stragglers have formed valuable auxiliary bearer parties during action, and will be gathered up by the regimental medical officer as he finds them, placed under non-commissioned officers and put to work pending return to companies.

3. Having exhausted the means at his disposal in the battalion he will consider assistance from outside. He will look to the field ambulance for further assistance. This brings up the question of communication. Immediately on establishing his aid-post he will get into touch with the nearest dressing station of the field ambulance through the following channels:

(a) Through brigade headquarters via battalion headquarters.

(b) Direct by orderly or signaller.

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* See also memoranda of assistant director of medical services, July 12th, and earlier data on training in regimental duties.

(c) Through assistant director of medical services office.

Once established, communications will be maintained.

The regimental medical officer will bear in mind that the battalion area is not the place for the field ambulance personnel to be working in. Consequently when he finds it necessary to call upon the field ambulance for assistance in bearer parties and transport he will find it of advantage to shift his aid-post farther forward, thus shortening the distance patients have to be carried from the firing line.

Reports. The regimental medical officer will make the following reports to officer commanding battalion, and medical officer in charge of advanced dressing station of field ambulance:

(a) Exact time and place a regimental aid post is opened or closed illustrating by sketch or reference to map. When opening auxiliary aid-posts he will state time at which other aid-posts will cease to receive patients and will leave an orderly at the post to be closed until that time.

(b) He will report to medical officer in charge of advanced dressing station supplies required, bearing in mind that it takes from one to two hours for them to reach him.

(c) Prospective casualties and nature of action contemplated or taking place to medical officer in charge of advanced dressing station.

(d) Time at which first casualties arrive at aid-posts, to medical officer in charge of advanced dressing station.

(e) Any information affecting transport or march between his post and advanced dressing station, e.g., destruction of bridges or roads, alternative routes of approach to aid-post illustrating by sketch.

The use of ambulance orderlies and drivers for carrying reports to advanced dressing stations will be made. These reports will be sent in writing.

Topography. Careful study of the question of topography will repay the regimental medical officer. A knowledge of this subject will provide him with information on the following points:

1. Roads. Their character, communications, etc.
2. Obstacles.
3. Cover. By examining the contours in relation to the firing line he will discover those routes which are under fire from various arms.
4. Position of woods and buildings, etc., which may furnish protection or obstacles.

The study of his map may be supplemented by personal observation of the ground behind his own lines. The ground in front that is in possessions of the enemy, he will have to study with a view to providing future aid posts solely by aid of his map and glasses.

Tactics. Since the tactics of the medical officer are dependent upon those of his unit he will make himself acquainted with the latter. The intention of the commander of the battalion is important to the medical officer since it will enable him to examine and provide for the establishment of aid-posts in new areas. The medical officer should go to officer commanding unit for all available information about battalion, brigade and divisional plans of action.

Collecting during the action. The extent and manner in which this is done depends on whether the action is an offensive or defensive one; whether it is in trenches or in the open; whether it is in the daylight or in the dark.

During the day when open fighting is in progress the medical officer's movements from point to point will be restricted by the ground and nature of action. He will remember that he is present at the action for the purpose of rendering aid to the whole battalion and will take steps to ensure that he is not in a position where his aid will be available to only a company or platoon. The majority of cases which reach him will be those able to walk or crawl and a few lying down cases from the immediate vicinity of his aid-post. He may be urged by others to go to places which will entail undue risks but he will be governed entirely by the needs of the battalion. The personal opinion of others, unless it coincides with his own judgement of the necessity for exposing himself, will be entirely disregarded. The individual officer or man is not to be succoured at the expense of the whole battalion.

During the day, when trench fighting is in progress the presence of the medical officer in the trenches is governed by the following consideration:

1. Whether trenches are linked up so that he may proceed to any point which his battalion is occupying, provided by reasonable cover.

2. Whether communication trenches with battalion headquarters are available.

3. The facilities for treatment other than that given by first aid men in the trenches are limited by space and equipment available. An efficiently-trained medical detail and battalion should not require the presence of the medical officer in the trenches each hour during the day.

During the night whether in open or trench-fighting, the medical officer will be fully occupied. The lying-down cases will be brought in; the darkness will provide him with cover permitting him to move from point to point, and attend to those cases which require his attention before moving; the cessation of the advance which often occurs at the onset of darkness and the straggling consequent on the increased difficulties of maintaining touch, will provide him with additional assistance in bearer parties. In using these stragglers he will bear in mind the primary purpose of their presence on the field, namely to fight, and will not detail them for carrying patients to points at a distance from the firing line which will make their return problematical. The thorough searching of the field, particular attention being paid to hedges, ditches and ravines, will be carried out.

At night the medical officer will take steps to replenish his supplies of dressings, food, water and morphine. He will replace casualties amongst his own bearers, reporting the new addition to his officer commanding.

The regimental medical officer's part in collecting after an action will depend on whether the action has been a successful one, and an advance has followed or not.

A successful action. (1). The regimental medical officer with his detail will remember that his place is with his regiment, and will follow it accordingly. He will notify the medical officer in charge of advanced dressing station of the position of his wounded and aid-posts, and will move on with his battalion. This information should be rendered in writing, illustrating by sketches if necessary, and reference to map. In sending reports to advanced dressing station and battalion headquarters, he will inform them of the steps he has taken in conjunction with, and the information he has rendered to, the medical officer in charge of advanced dressing station in order to avoid unnecessary duplication of orders and personnel detailed.

An action in which success is not followed by an immediate advance calls for little change in position.

An unsuccessful action, if not followed by a retirement produces little or no change in plan. If followed by retirement, the medical officer will endeavour to clear his patients, but when he finds that capture of himself and personnel is in prospect he will leave sufficient supplies of food, water and personnel to ensure the welfare of the wounded and will withdraw the remainder of his detail and equipment and carry out his duty with his battalion.

From the above notes the regimental medical officer will see that the greatest emphasis and care should be spent on training. Brilliant results are not obtained by plans evolved on the spur of the moment. Plans must be based on a wide knowledge of the ways and means utilized by all branches of the service to obtain their maximum efficiency. Details ignored may spoil any plan. Care of one's instruments is necessary if one is to obtain the best results. Trouble spent on training one's men and whetting their appetite for information will produce a keenness for their work and good results that will cut many a Gordian knot. To the officer in charge of medical details few things will produce such good results as will his personal interest in and care of his detail. Next to the care and attention of the wounded should come the care and attention to his detail. See that they are well fed and trained when well, and looked after when ill. Set them the example of unselfishness and loyalty, and they will make you sure of your results at any time and place. The greatest asset an officer can have is the respect and loyalty of his men.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Practitioner and Review, September, 1915:

The treatment of arthritis	E. Seaborn.
The clinical aspects of intestinal obstruction	A. R. Gordon.

The Canada Lancet, October, 1915:

Tuberculosis and the bacteriology of everyday life	Sir James Grant.
The work of the observation hospital for mental cases	Harvey Clare.
Morphine scopolamine narcosis in labour	J. G. Gallie and W. A. Scott.

The Western Medical News, October, 1915:

Two case reporst	J. W. Turnbull.
Maternity and the handy woman	J. A. Rose.
Intercostal thoractomy in empyema	H. Lilienthal.

Medical Societies

ONTARIO MEDICAL ASSOCIATION

The thirty-sixth annual meeting of the Ontario Medical Association will take place in Toronto on May 30th and 31st, June 1st, and June 2nd, 1916, in conjunction with the annual meeting of the Provincial Health Officers' Association.

COLLEGE OF PHYSICIANS AND SURGEONS OF ALBERTA

The Council of the College of Physicians and Surgeons of Alberta was appointed on July 7th, last, for a period of four years. The members of the Council, who are representative of the seven districts of the province, are, Dr. John Park, of Edmonton; Dr. F. W. Crang, of Edmonton South; Dr. R. D. Duggan, of Killam; the Honourable R. G. Brett, of Banff, Lieutenant-Governor of the province; Dr. R. D. Sanson, of Calgary; Dr. G. E. Learmonth, of High River; and Dr. W. S. Galbraith, of Lethbridge. The first session of the council was held at Edmonton on Thursday, October 14th, and was devoted almost entirely to business. The election of officers resulted as follows: president, Dr. F. W. Crang, of Edmonton South; vice-president, Dr. W. S. Galbraith, of Lethbridge; registrar and treasurer, Dr. C. W. Field, of Edmonton, Executive Committee: Dr. Crang, chairman, Dr. Sanson, Dr. Duggan, and Dr. Park. Finance Committee: Dr. W. S. Galbraith, chairman, the Lieutenant-Governor, and Dr. Crang. Discipline Committee: Dr. Park, chairman, Dr. Sanson, Dr. Learmouth, and the Lieutenant-Governor. Legislative Committee: Dr. Crang, chairman, Dr. Learmonth, Dr. Galbraith, and Dr. Duggan.

LAMBTON COUNTY MEDICAL ASSOCIATION

The Lambton County Medical Association met in the Public Library at Forest, on October 13th. Dr. P. McG. Brown, of Camlachie, presented two very interesting cases to the Association;

1. Petit Mal.
2. Pulmonary Tuberculosis.

Dr. A. J. Grant, of Thedford, read a paper on the use of Pituitary Extract in Obstretrics, which was followed by a lively discussion.

The next meeting will be held in Sarnia, in February, 1916.

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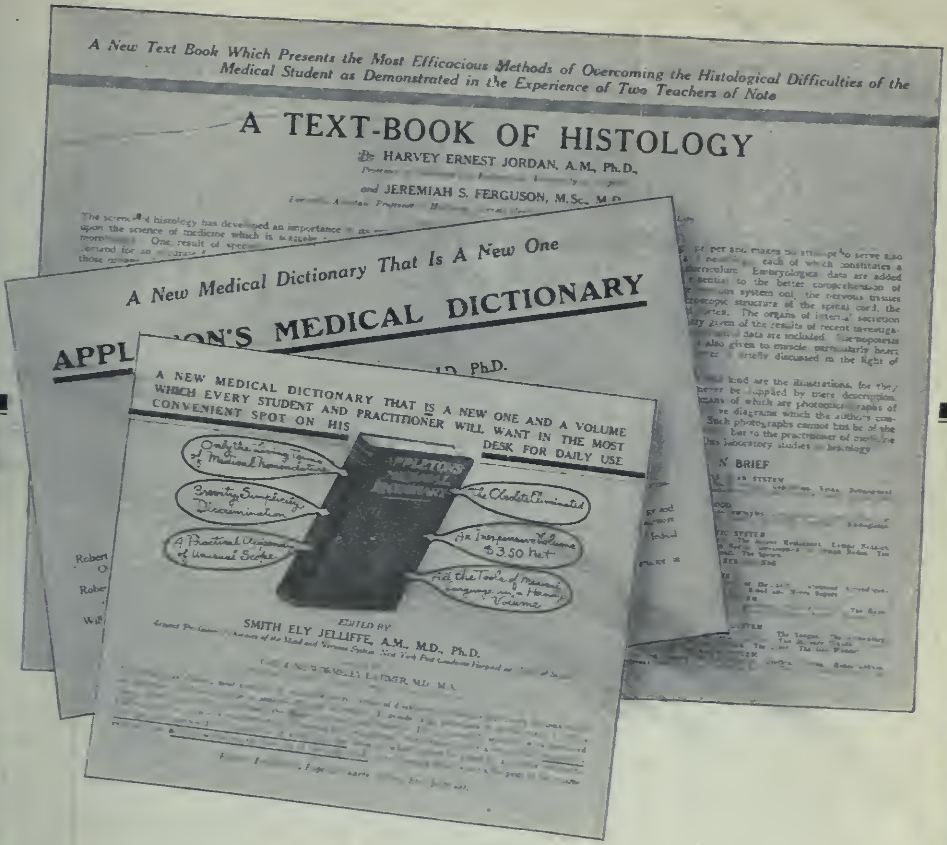

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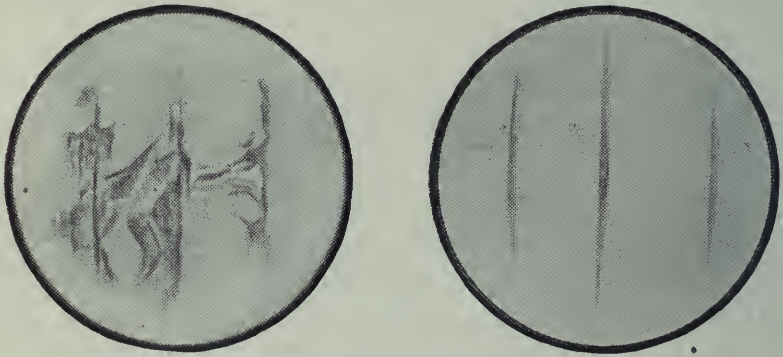

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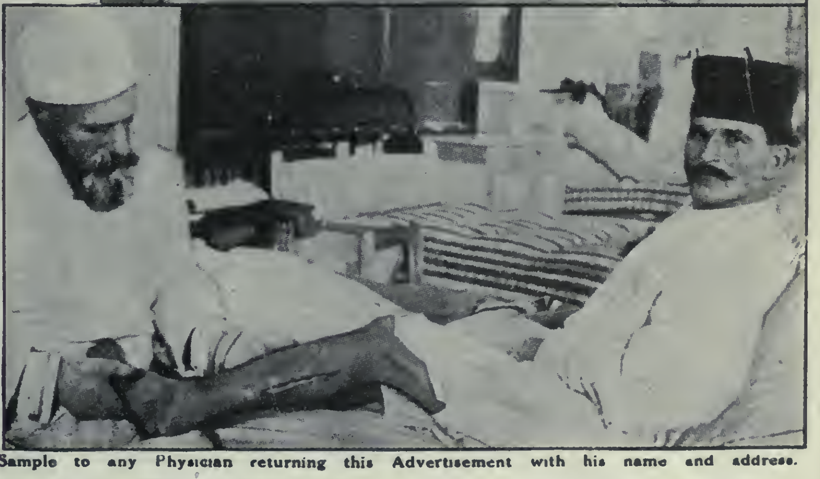

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